THE IRON AGE

New York, June 7, 1928

ESTABLISHED 1855 VOL. 121, No. 23

Cupola Fired with Powdered Coal*

High Temperatures, Greater Strength and Lower Total Fuel Consumption Claimed—Less Absorption of Sulphur and Close Control of Carbon

THE use of powdered coal in the cupola, described in this article, is the third major development introduced in recent years to improve the efficiency of this melting unit. Some interesting results and claims are made. The Schuermann side-blast cupola, a German invention, was described in THE IRON AGE, *Oct.* 19, 1922, *page* 991, *and Nov.* 22, 1923, *page* 1377. *Among the claimed advantages was a fuel saving of* 25 *per cent and hotter iron. The Vial hot-blast cupola was discussed in* THE IRON AGE, *Oct.* 20 *and* 27, 1927. *With this a fuel saving of at least* 20 *per cent was among the advantages enumerated.*

UNTIL very recently cast iron foundries have used the old-fashioned cupola almost exclusively as a melting unit with satisfactory results. Progress in casting design, however, has demanded strength as a prime characteristic of cast iron, so it has behooved the foundrymen to meet this requirement.

Obviously, many changes calculated to produce a grade of iron having superior strength have been tried out, and, doubtless, many improvements have been made already in a normal cupola of the conventional type.

The main advantages of the old cupola over each new system of melting and over the different specially-built cupolas are the low melting cost and the simple manner of operation. Usually these advantages more than offset the disadvantages of inaccurate control of the carbons, the picking up of sulphur from the foundry coke by the iron and the possibility of oxidation.

To eliminate these disadvantages and still retain the reduced melting cost and the simple manner of operation is the problem that must be solved before any basic development can survive competition with the old style cupola.

Principle of the Powdered Coal Cupola

About a year and a half ago, D. H. Meloche, of the American Radiator Co., conceived the idea of using powdered coal as a fuel, in connection with a minimum coke charge, by burning the coal under pressure outside of the shell proper and allowing the products of combustion to pass directly to the melting zone at a velocity insuring penetration.

Under average conditions, the cost of a ton of coal is only one-half that of a ton of coke, and, because, of this, it is a fact that running on coke with the same melting ratio, namely, iron to total fuel, is more expensive than replacing a portion of the coke with coal.

The powdered coal cupola, which is operated in the Springfield, Ill., plant of the American Radiator Co., has proved that through the use of powdered coal fuel it is possible to reduce the ratio of total fuel consumed to the amount of iron melted.

In a normal cupola there is a large loss of heat because of the reaction between the carbon dioxide and the carbon of the coke above the melting zone. The complete combustion of one pound of carbon and pure oxygen to carbon dioxide sets free 14,544 B.t.u., whereas burning the same amount of carbon in an insufficient supply of oxygen to carbon monoxide sets free only 4450 B.t.u. In this reaction, part of the carbon of the coke forms CO_2, and there is a first loss of practically 10,000 B.t.u. Besides this, the breaking up of the CO_2 requires 10,094 B.t.u. These figures show very clearly the enormous amount of wasted heat, which should be free for superheating the iron charges in a normal cupola. As before mentioned, because of the small coke charges in the pulverized coal cupola, it is natural that the amount of CO_2 dissociated by the carbon of the coke above the melting zone is much lower.

In the powdered coal cupola system, the pulverized fuel comes to complete combustion in the chambers outside of the stack and the hot gases alone are blown into the melting zone, so that the full amount of B.t.u. of the coal is retained for melting the iron. The ratio between the amount of air for combustion and the amount of powdered coal is so regulated that the atmosphere in the melting zone is either mildly reducing or neutral. Due to this fact, the bed coke does not get burned out so rapidly as it does in a normal cupola. Therefore, it is possible to hold up the bed and melt on a charge of coke of only 2 to 4 per cent of the iron melted.

Accurate Control of Carbon Content

Because of the more accurate control of combustion in the powdered coal cupola, we obtain more accurate carbon control and, as we use less coke, the total carbons are likewise decreased. As the combustion of the coal takes place in the chambers and the hot gases pass into the zone of the charge, they do

*From an address delivered before the Wisconsin Foundrymen's Research Group, Milwaukee, June 6, by Dr. Fritz Meyer, American Radiator Co., New York.

not pick up any of the sulphur of the powdered coal and only a very small amount of the sulphur from the coke, because, as already mentioned, only 2 to 4 per cent of coke between charges is used.

At the Illinois plant we ran for comparison the same iron mixture with the same grade of coke in both the powdered coal cupola and in a normal cupola and found that the sulphur in the iron melted in the powdered coal cupola was from 20 to 30 per cent lower than in the iron produced from the normal cupola, and that the total carbon decreased approximately 20 per cent. In addition to these advantages, there was less oxidation, as the air control is so regulated that a neutral or mildly reducing atmosphere is produced during the entire operation of the heat.

The two samples of iron which I will pass through the audience will show the advantageous influence of melting in the powdered coal cupola.

A cupola was running into trouble with oxidized iron. As can be seen from sample No. 1, the iron shows a dark, dead structure typical of oxidized iron. The cast iron was brittle and, consequently, had a very low transverse strength with practically no deflection. This iron was sent to our plant to be melted in the powdered coal cupola. Sample No. 2 shows the structure of this iron after having been remelted. Inspection of these samples clearly proves the influence of this new cupola. The iron was deoxidized.

Graphite Precipitation Very Fine

Microscopical research work on the product of the powdered coal cupola shows, with each kind of mixture, a very fine graphite precipitation. As a reducing atmosphere has no direct influence on the fineness of the graphite precipitation, we tried to find an explanation for this. It is as follows:

There must be, in this cupola, a zone of extremely high temperatures (a powdered coal flame shows an average temperature of 3100 deg. Fahr.). The iron drops going through this zone become highly superheated and, because of this, have a tendency to solidify with a fine graphite precipitation.

In papers and technical literature of the last three years much information has been published regarding the influence of melting temperatures on structure and quality of either high or low-carbon cast iron. Therefore, I need not go into details regarding this.

Physical Properties Compared

Comparative physical tests made on test bars, from normal cupola and powdered coal cupola, have shown that transverse strength and deflection are about 10 to 15 per cent higher on the bar from the new cupola. On the 1-in. square test bar with a bearing distance of 12 in., we found, for instance, that the same mixture, averaging 2900 lb. breaking strength with a deflection of 0.245 in. for the bar from the normal cupola, averaged 3300 lb. transverse strength with a deflection of 0.255 in. from the powdered coal cupola.

A recent test made with low-carbon iron showed a transverse strength averaging 4468 lb. with a deflection of 0.250 in., which is, you will agree, a high test for cast iron.

As before mentioned, iron from the powdered coal cupola shows 20 to 30 per cent less sulphur content than the same mixture melted in a normal cupola. Remelting our own remelt iron showed that, by replacing a sufficient amount of the coke with coal, the picked-up sulphur is practically negligible. Remelt iron with an average of 0.085 to 0.090 per cent sulphur did not show an average increase in sulphur content of more than 0.020 per cent.

How do we account for the iron not picking up sulphur? It is our theory that the sulphur passes off in the form of either sulphur dioxide, sulphurous acid or sulphuric acid. The question naturally arises: What is the source of the hydrogen? The answer lies in the fact that a coal is used with approximately 35 per cent volatile matter, which is comprised partly of hydrogen. In addition to this, the fuel carries a certain percentage of moisture, up to about 3 to 3.50 per cent. It is not necessary to dry this fuel before it is pulverized.

Equipment Necessary

The cupola stack is an ordinary straight stack and does not differ in any way from the stock Whiting cupola without the wind belt. The powdered coal cupola now in use has a melting zone diameter of 40 in. and shows an hourly output of about 6 to 7 tons. It has four combustion chambers parallel to the cupola stack. On the top of each chamber is the burner and on the bottom of each one is the entrance for the hot gases from the combustion chambers to the stack. This entrance is at the same elevation as the tuyeres in a normal cupola and replaces them.

Life of Refractories

Before starting the experiments, the present operators of the powdered coal cupola were of the opinion that the lining of the combustion chambers would not withstand the temperature, but experience has shown that the lining does not give any trouble. To date, the cupola has been running over six months without relining the combustion chambers, and from all appearances they look the same as when installed, except that the bricks are well glazed throughout.

As for the patching operation in the stack after heats, figures have been compiled which prove that it costs no more to maintain linings in this cupola than in the normal type.

Economies and Advantages Claimed

For an average heat it takes 130 lb. of fuel to melt one ton of iron, coke averaging 60 per cent of the fuel:

$$0.60 \times 130 \times \frac{\$10.36}{2000} = \$0.40 \quad \text{Cost of coke per ton of metal}$$

$$0.40 \times 130 \times \frac{\$5.07}{2000} = 0.13 \quad \text{Cost of coal per ton of metal}$$

Overhead 0.14

$0.67 Cost of fuel per ton of iron

Assuming that an 8 to 1 melting ratio is an average for coke melting, it would take 250 lb. of coke to melt a ton of iron.

$$250 \times \frac{\$10.36}{2000} = \$1.29$$

Overhead 0.06

$1.35 = Cost of melting with coke

Subtracting $0.67 from $1.35 shows a saving of $0.68, or 50.4 per cent.

The overhead for a powdered coal installation is estimated from the experience of the Whiting Corporation with Grindle pulverizers in connection with malleable iron furnaces. The costs of coal and coke are those at the Illinois plant.

Other Metallurgical Benefits

Additional benefits estimated from a metallurgical viewpoint cannot be given in dollars and cents. It is easy to understand that, with the metallurgical advantages of the use of powdered coal, a larger amount of scrap can be used in the mixtures with beneficial results.

In recent tests the fuel ratio, coke to coal, has changed in our favor, which means that we have been able to change the fuel consumption to 60 per cent coal and 40 per cent coke. Theoretically it is possible

to fire the cupola with powdered coal alone, provided a sufficient refractory material can be found to support the charge. The present installation does not permit such operation, but this paper is not intended to state that the powdered coal cupola has been perfected.

Temperatures of the iron at the spout of the powdered coal cupola compare favorably with those of the normal cupola. They can best be judged by the light metal type of castings which are being poured and which have to be tested at from 400 to 1000 lb. hydraulic pressure and at 300 lb. air under water. The temperature at the spout averages between 2650 and 2760 deg.

Summarizing the advantages claimed for the powdered coal cupola:

First: Avoidance of picking up sulphur in the iron from the coal fuel.

Second: Better control of carbon in the mixture because of the more accurate control of combustion, and higher strength because of superheat.

Third: The possibility of extensive reduction in price of various mixtures.

Fourth: Saving in melting cost because of smaller amount of fuel required.

Accidents Fewer and Less Severe in Metal Industries

Frequency Rate Dropped from 35.45 to 26.59 Per Cent and Severity Rate from 2.44 to 1.85 Per Cent

MARKED decrease in both the severity and frequency of industrial accidents in the metal industries during 1927 as compared with 1926 is shown in the annual report of accident experience of members of the National Safety Council, just published by that organization. The average accident frequency rate, or number of lost-time personal injuries per one million hours' exposure, of 450 metal-working establishments reporting in 1927 was 26.59, as compared with 35.45 in 318 plants in 1926 and with an average for the five years ended with 1926 of 36.06. The accident severity rate, or loss in working days per 1000 hr. of exposure, was 1.85 in 1927, against 2.44 in the preceding year and a five-year average of 2.23. The frequency rate in 208 establishments, or 46 per cent of the total reporting in 1927, was below the previous year's figure, while 321 plants, or 71 per cent of the total, had lower severity rates in 1927 than in 1926. Thirteen establishments completed 1927 without a lost-time injury.

As the accompanying table shows, eight of 13 groups into which the metals section has been classified reported a decrease in accident severity rate in 1927 as compared with 1926. Those showing an increase were structural steel fabricators, gray iron foundries, makers of machinery and machine tools, railroad car builders and manufacturers of tubular goods. Increases in frequency rates were reported by bolt and nut manufacturers, malleable iron foundries, machinery and machine-tool makers and steel foundries, while the remaining nine groups showed decreases.

Metal Industries Close to Average

That the accident record of the metal industries approximates that of manufacturing industries as a whole is shown by the fact that 2089 establishments reported to the national council an average accident frequency rate in 1927 of 25.95 in 1927, as compared with 31.87 in 1926, and a severity rate of 1.88 last year, as against 2.50 in the preceding 12-month period. The automotive industries had a frequency rate of 21.51 in 1927 and 23.60 in the previous year, while the severity rate in this field was 1.01 in 1927 and 1.37 in 1926. The construction and petroleum divisions reported a higher rate in both severity and frequency last year than in 1926, while the frequency rate was higher in the rubber group. All the other industries reported a decrease in both the severity and frequency of accidents in 1927.

Comparison of Accident Experience in Metals Industries in 1927 and 1926

Group	No. of Companies	Average No. Employees	Total Hours Worked	No. Lost-Time Accidents	No. Days Lost	Frequency Rate	Severity Rate
Coke plants:							
1927	7	2,858	8,462,907	157	35,390	18.55	4.18
1926	7	3,228	9,266,885	401	59,947	43.27	6.47
Bolt and nut makers:							
1927	9	5,135	12,312,166	328	11,881	26.64	0.96
1926	2	1,790	4,561,011	70	7,529	15.35	1.65
Structural steel fabricators:							
1927	29	9,556	23,256,531	1,161	92,111	49.92	3.96
1926	19	7,216	17,725,475	1,423	64,732	80.30	3.66
Gray iron foundries:							
1927	28	14,794	37,140,703	1,923	91,473	51.78	2.46
1926	31	19,038	48,551,841	3,132	103,588	64.52	2.13
Malleable iron foundries:							
1927	14	4,739	12,487,244	593	17,761	47.49	1.42
1926	20	10,101	26,465,019	1,103	44,484	41.68	1.68
Machine shops with foundries:							
1927	73	90,165	216,161,972	4,444	294,441	20.56	1.36
1926	40	38,509	94,560,087	2,521	166,581	26.67	1.76
Machinery and machine tool:							
1927	101	38,353	89,315,238	3,234	175,905	36.21	1.97
1926	77	51,010	128,918,842	3,706	219,568	28.75	1.70
Railroad car makers:							
1927	15	6,966	13,055,266	465	59,708	35.61	4.57
1926	6	3,935	9,870,834	415	16,445	42.04	1.67
Steel plants:							
1927	82	107,474	294,855,220	6,230	522,952	21.13	1.77
1926	58	89,416	252,275,354	8,093	750,018	32.09	2.97
Steel foundries:							
1927	21	7,747	20,136,896	1,039	52,450	51.60	2.60
1926	15	6,690	17,383,530	836	69,423	48.10	3.99
Tubular goods makers:							
1927	23	12,612	35,171,683	1,151	91,110	32.73	2.59
1926	9	7,845	20,794,330	684	38,628	32.90	1.82
Wire manufacturers:							
1927	32	22,009	45,348,061	725	58,213	15.99	1.28
1926	21	15,593	37,880,332	1,424	71,077	37.59	1.88
Miscellaneous:							
1927	16	3,946	10,914,285	314	12,510	28.77	1.15
1926	15	7,070	17,960,452	520	62,205	28.95	3.46
Total 1927	450	326,362	818,618,172	21,764	1,515,905	26.59	1.85
Total 1926	318	261,441	686,213,992	24,328	1,674,225	35.45	2.44

Enlarging Steel Mill Possibilities

Greater Flexibility and Increased Range of Product for Timken Plant—Unusual Electric Melting Furnace

STEEL manufacturing capacity of the Timken Roller Bearing Co., Canton, Ohio, will be considerably enlarged by the carrying out of its announced expansion program. Not only will the output both in steel making and rolling of alloy steels be materially increased, but the plant will produce a wider range of finished bar sizes than heretofore. It is expected that, with the new mill equipment and with the rearrangement of the old units, the cost of steel making will be reduced considerably and at the same time a higher quality product will be produced. The enlarged plant will have a capacity of 24,000 tons a month. Construction is now under way and it is expected that the new units will be completed by Nov. 1.

Additions will include an electric melting furnace of unusual design, two 100-ton open-hearth furnaces, a 28-22-in. bar mill, a 16-stand merchant mill which will have various interesting features, reheating furnaces, new hotbeds and tables and other auxiliary mill equipment. Several new buildings are being erected to house the new equipment and for storage. The arrangement of the mills and the tables and cooling beds provides for wide flexibility in operation. There will be a range in sizes of finished bars, from 8-in. rounds at the first finishing stand down to ¼-in. rounds at the last merchant mill stand.

Exceptional Electric Melting Unit

The new electric melting furnace, which is of the Héroult type, will doubtless attract considerable interest because it will be elliptical instead of circular in plan. In place of the usual three electrodes, it will have six electrodes arranged in two groups of three electrodes each. Power for each group will be supplied through two separate 10,000-kva. transformers housed in brick compartments, one at each side of the furnace. The dimensions of the oval furnace shell will be 20 x 29 ft. The electric furnace will be charged, with the open-hearth charging machine, through two 4-ft. 6-in. doors. There will be two additional working doors on the spout side.

Waste-heat boilers will be erected to utilize heat from the two new open-hearth furnaces. Space for these and for the new electric furnace will be provided in a 240-ft. extension to the steel plant building, which, with leanto, is 153 ft. wide. New handling equipment to be installed in the electric furnace and open-hearth departments will include a 165-ton ladle crane, a 30-ton crane over the charging floor and a 5-ton open-hearth charging machine. The stock house will be enlarged by a 105-ft. extension.

Melting equipment in the enlarged steel making plant, with the additional units, will include the new oval-type electric furnace, two 25-ton and one 7½-ton electric furnaces and three 100-ton open-hearth furnaces. In addition, there are two 6-ton electric melting furnaces in another building.

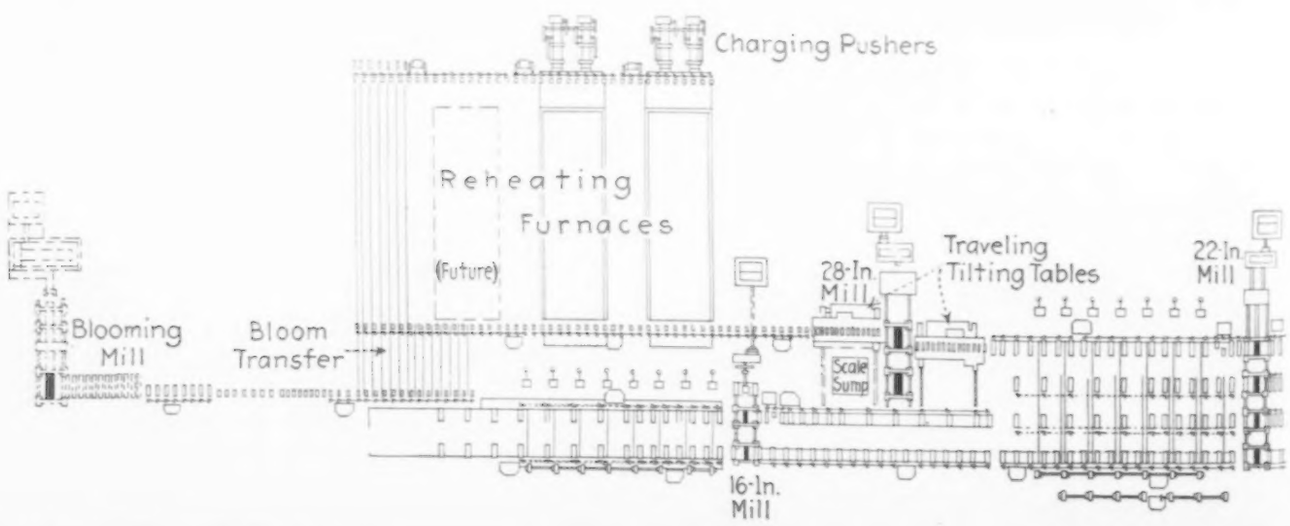
A new ingot stripping and hot top storage building, 89 x 98 ft., is being erected. This will be equipped with a 5-ton combination stripping and soaking pit crane, which will be moved from the old soaking pit building. There will also be a new mold storage building, 80 x 160 ft., equipped with a 30-ton electric traveling crane.

As the increased steel-making capacity necessitates additional soaking pits, a new soaking pit building, 80 x 165 ft., is being erected. This will have three two-hole soaking pits, each hole being 6 ft. 6 in. x 14 ft. The new pit furnaces will be served by a 7½-ton soaking pit crane.

Changes in Rolling Equipment

In the present rolling mill layout there is a 35-in. three-high blooming mill and a 22-in. four-stand bar mill, but no table connections between the two mills. As rearranged, with the new mill tables and other equipment, the blooms will pass from the 35-in. mill to a 10-in. x 10-in. shear, over a runout from the shear and on to a bloom transfer table. From this they will be transferred either to the runin table to the new 28-in. mill or to the charging end of two 40-ton continuous reheating furnaces.

These furnaces will have end charge and end discharge. They will be 20 ft. wide, approximately 70 ft. long, and natural gas fired. The charging table to



the furnaces will be 114 ft. long, accommodating space for a third (future) furnace. The furnaces will be charged directly from the 35-in. mill or with cold blooms from the chipping yard. They will be charged with double pushers electrically operated.

Direct Run to 28-In. Mill

If the blooms are not reheated, they will go directly to the 28-in. mill, which will consist of two three-high stands with rolls 84 in. long. This mill will be served by two traveling tilting tables driven by worm-gear speed reducing sets. The entering table will be equipped with manipulators. The mill will be driven by a 1500-hp. induction motor through a gear drive provided with flywheels. The runin table to the mill will be 150 ft. long. Bars in finished 6-in. to 8-in. sizes will be made on this mill. The 6-in. to 8-in. finished sections will be transferred from the mill runout table by rope transfer and past the 22-in. mill to the first hot bed.

However, most of the product is reduced to smaller sections, and the usual operation of this mill, which will be applied in rolling the smaller sections, will be to use the 28-in. mill as a roughing mill for the 22-in. mill. The latter mill, which is being rebuilt, will consist of three three-high stands and one two-high stand. The first two three-high stands will have rolls 66 in. long and the last three-high and the two-high stands will have rolls 60 in. long. This mill will be equipped with tables having solid standings and with rope transfers both at the front and back sides. This will permit giving the steel any number of passes through the rolls.

Finished bars in sizes from 7½-in. down to 1¾-in. rounds or their equivalent will be produced on the 22-in. mill. When rolls are to be changed, the mill housing and rolls will be picked up as a unit by an overhead 50-ton crane and transferred to another section of the mill building.

New Structures Necessary

The 28-in. and the 22-in. mill will be located in a new building 288 ft. long and 100 ft. wide, which will connect the old 35-in. and 22-in. mill buildings, being located in a heretofore unoccupied space between these two buildings. New structures will include also a bloom building, 385 ft. long and 100 ft. wide, to be served by two 15-ton cranes.

There will be cooling pits in this building for the slow cooling of some grades of alloy steel which have a tendency to crack when cooled in the open air. These steels, after leaving the blooming mill, will remain in the cooling pits about 24 hr. before going to the reheating furnaces. Cooling pits will be provided also for cooling bars of certain alloys after leaving the 22-in. mill.

Leaving the 22-in. mill, the bars will pass on a runout table 260 ft. long to the first of two hot saws, located in front of the hotbed. Two hot saws working together will be provided, to increase the rapidity of handling the steel. From the hot saws the larger sections from the 28-in. and 22-in. mills will go to a new hotbed 109 ft. long and 40 ft. wide. This will be of the flat skid type with dog pullovers. The hotbed table will be equipped with two motor-operated gage stops. Bars will be handled from the hotbed with a magnet, or pushed over the table, from which they will pass to a cold shear at the end of the hotbed.

Smaller sections coming from the 22-in. mill will not go to the hotbed referred to above, but will pass over a runout table at one side of this hotbed on to a smaller notched bar type hotbed, 120 ft. long and 20 ft. wide, which was a part of the old equipment and has been relocated. This will have a cold shear at the discharge end.

Making Smaller Sections

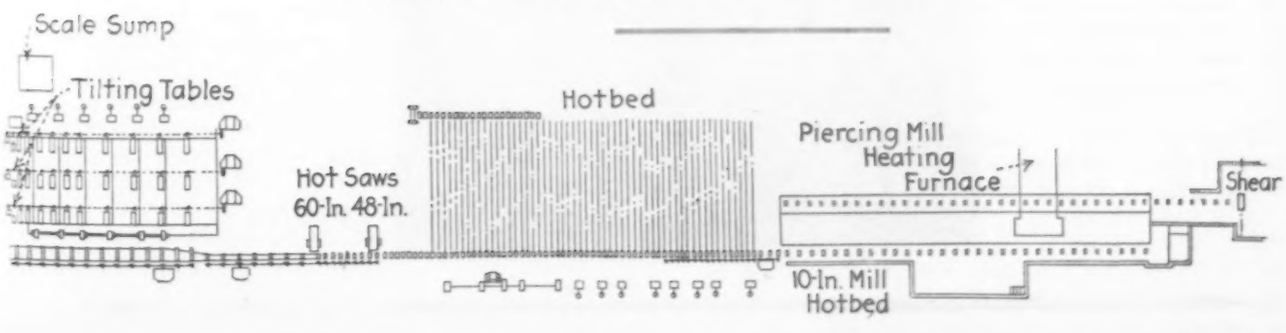
If the steel is to be further reduced after leaving the 22-in. mill, it will go to the 16-stand merchant bar mill, located back of the 22-in. mill. This mill will consist of three 18-in. two-high roughing stands, five 16-in. continuous stands and two 16-in. three-high, four 12-in. and two 10-in. stands. On this mill 3-in. x 3-in. or 4-in. x 4-in. billets rolled on the 22-in. mill, and taken from an adjoining billet storage yard, will be reduced to a range of ¼-in. to 2¼-in. round bars or equivalent sizes in other sections. From this mill the finished bars will pass to a mechanical hotbed, 240 ft. long.

All mills, mill drives, tables and cranes will be equipped with Timken tapered roller bearings.

The two 28-in. three-high mill stands and three new 22-in. mill stands and pinions, hot saw, transfer, tilting and roller tables, furnace pusher and bar shear will be supplied by the United Engineering & Foundry Co., Pittsburgh. The Wheeling Mold & Foundry Co., Wheeling, W. Va., will furnish the traveling tilting tables for the 28-in. mill. The Mesta Machine Co., Pittsburgh, will build the new merchant mill complete, and will furnish the furnace skid bed with runin table and pusher, billet shear, mill transfer and delivery tables, flying shear and the mechanical pack annealing cooling bed.

The two open-hearth furnaces will be built by Alex Laughlin & Co., Pittsburgh. The shear approach table will be furnished by the Mackintosh-Hemphill Co., Pittsburgh. The Morgan Engineering Co., Alliance, Ohio, will build the hotbed. The James Criswell Co., Pittsburgh, will build the new soaking pits. The Rust Engineering Co., Pittsburgh, will supply the three reheating furnaces. The waste-heat boilers will be furnished by the Babcock & Wilcox Co. The drive for the 28-in. mill will be furnished by Gears & Forgings, Inc., Cleveland. The American Bridge Co. will build the 20- x 29-ft. electric furnace.

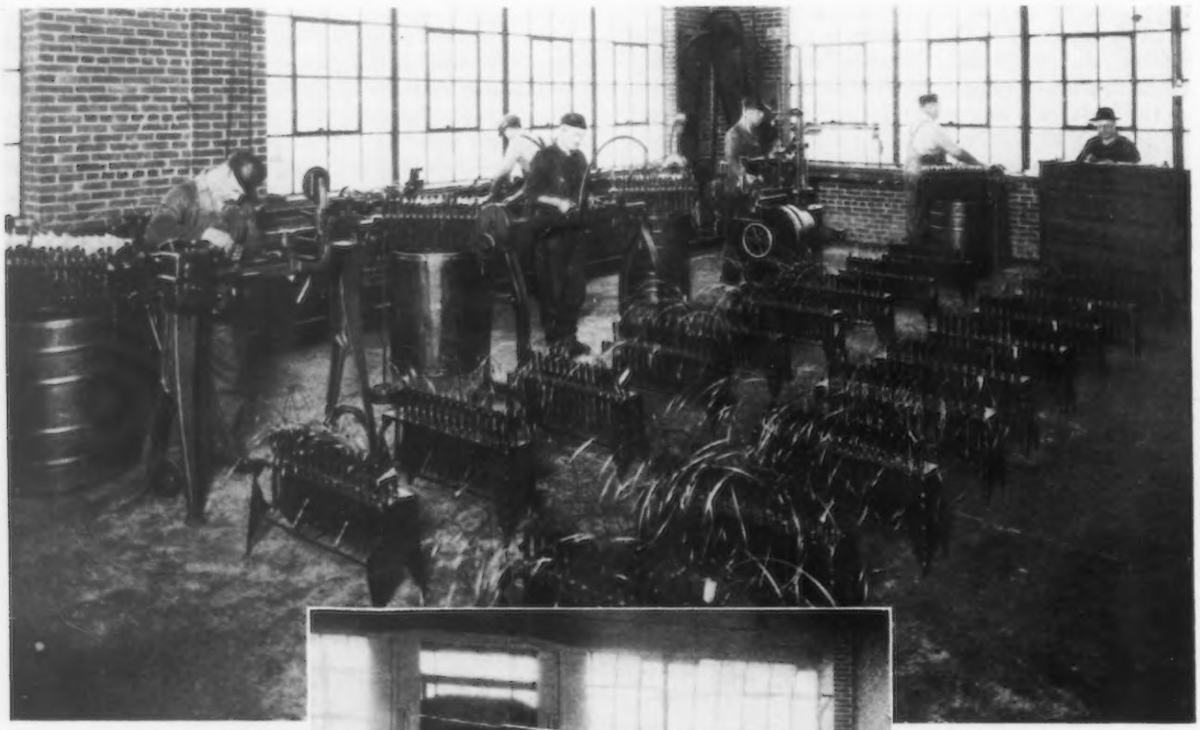
LAYOUT of the New Rolling and Intermediate Handling Equipment of the Timken Plant, from the (existing) Blooming Mill to the Shear Beyond the Hotbeds. Flexibility is a feature, it being possible to run given bars through any one of several mills in the progressive stages of breaking down the steel to finished size



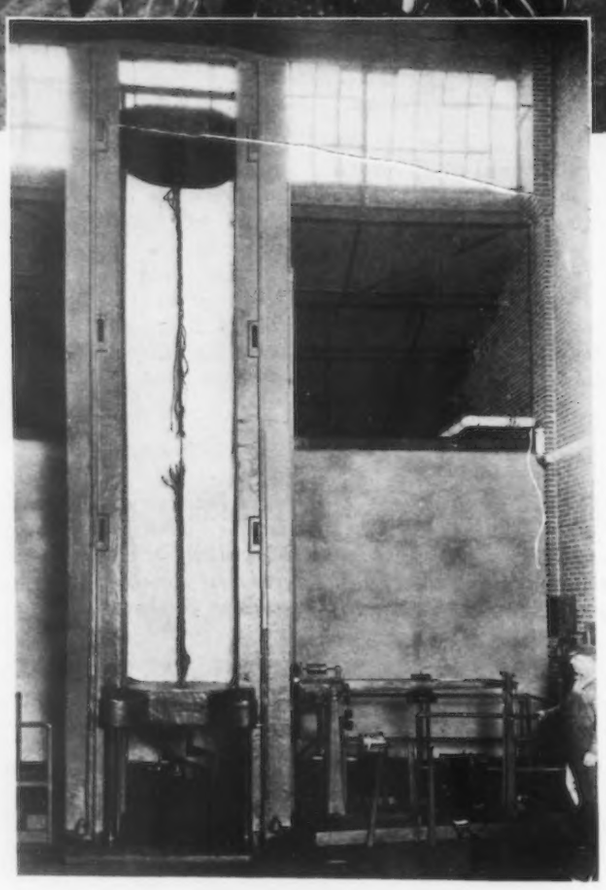
Big and Little Machines for Testing Wire Rope

MANUFACTURING plants where operations are based on the principle of quality as opposed to mass production require meticulous care in the testing of materials. An interesting example is to be found in the factory of A. Leschen & Sons Rope Co., St. Louis, manufacturer of wire rope. Research work has enabled it to ascertain the correct combination of properties of wire in order to produce rope for various exacting demands. To make sure that each individual wire meets the necessary specifications, the testing laboratory samples and tests each bundle of wire as it comes from the mill for strength, elongation, torsion and bending.

The laboratory is adjacent to the receiving department and occupies a space 168 ft. long and 77 ft. wide. It is equipped with Olsen torsion and tension machines, as well as with other special equipment. In order to avoid confusion in identifying wire which is being tested, portable holders shown in the view have been built. Each consists of 30 metal tubes, into each of which may be placed a sample of wire, the extra length dangling.



ABOVE Is Shown a Corner in the Testing Department With a Battery of Machines for Studying the Properties of Each Wire. Note the portable holders in the foreground for maintaining the identity of samples without error. They straddle waste barrels alongside machines and thus prevent accumulation of litter



NOT Only Must Every Wire Be Strong But the Cable Maker Must Be Sure That Fabrication Methods Produce a Rope of Correct Strength. At center is shown an 800,000-lb. Olsen tension testing machine, the largest ever built expressly for wire rope testing

Bronze Bearings for Heavy Duty

New Conditions Being Met by Proper Design and Crystal Structure—Some Common Errors in Design—How to Select the Right Material for Bearings

BY N. K. B. PATCH*

DURING the last few years there has been a marked development in improved materials for the manufacture of mechanical units, and this has not been confined to the steels and irons alone. The application of alloy steels, especially hardened steels, to shafts or journals in mechanical units has enabled the engineer to use new types of bronze bearings that would have been disastrous in the days of the old steels. Under present conditions of heavy duty, neither the old steel nor the old bronze would have stood the present punishment. Either or both would have been subject to condemnation not truly their due, but most assuredly the fault of the lack of knowledge on the part of the designer.

With the advent of improved materials in the shafts or journals, improved methods of obtaining accuracy in machining such rotating parts were also available. This improved accuracy no longer calls for a bronze bearing that has as one of its characteristics a conformability or plasticity to compensate for the irregularity in the workmanship of machining the journal itself. Through the elimination of this requirement of conformability, it is now possible to use the harder steels for the shafts or journals and the harder bronzes for the mating bearings. These bronzes, through their hardness, have less conformability but are, in wearing capacity in conjunction with the harder steels, a vast improvement.

Bearing Is a Mixture of Hard and Soft Crystals

A bearing bronze is essentially a mixture of hard and soft crystals, the hard crystals being the supporting media for the load and the softer crystals being the matrix in which the harder crystals are embedded. When subjected to wear, as in a bearing, the softer crystals abrade first, forming microscopical pockets in which the oil film is tenaciously held. The hard crystals, being harder than the surrounding matrix, do not abrade as fast, but to have satisfactory results from bearing bushings or other types of bearings, the hard crystal in the bronze must not be out of proportion to the hardness of the material in the shaft or journal; otherwise, the shaft or journal is scratched by these hard crystals in the bearing, friction is increased with a consequent temperature rise, which may, in turn, destroy lubrication, with disastrous results

To lay down a law relative to the relationship between the crystal hardnesses in the bearing and those in the journal or shaft is impossible in the light of present knowledge. It has, however, been definitely proved that, with the advent of the harder steels and the increased accuracy of manufacture of these shafts and journals from these steels, harder bronzes are not only an improvement but are essential to long life and satisfactory maintenance of accuracy in the fit of journal and bearing.

It is interesting to note at this point that a bronze of a given chemical analysis, such as many of those which are now used for bearings, may, if intelligently manufactured, when examined under the microscope, show a diversity of structures, each of which would have a definite hardness by reason of the difference in the amount of the hard crystals present therein.

Laboratory Control Is Essential

It is therefore apparent that laboratory control of the manufacture of the bearings or bushings from these alloys is essential to insure a uniformity of structure that may be relied upon to maintain the standard of the relationship between the hardness of the bearing and the hardness of the journal.

After an engineer has decided upon a certain kind of steel for shaft or journal, which is to have a certain heat treatment and will consequently be of a definite hardness, he will, in turn, need a definite hardness of bearing bronze to mate with it, and all of the parts so mating with the steel in the several machines must be exactly alike and uniform.

Many designers are not aware of the improved service to be derived from bronzes in which the crystal structure has been carefully controlled. Such a structure is, of course, more important where extreme accuracy is one of the governing factors, but it is also essential from the standpoint of long life and uninterrupted service of a given mechanical device.

It should be borne in mind that, with the advent of the harder steels and the use of a mating harder bronze, improved precision in workmanship on these two mating parts is imperative. This is, however, a much easier matter today by reason of the improved precision of modern machine tools as compared with those in use but a few years ago.

Too Many Oil Grooves a Common Error

Many of the plain bearings that have been condemned have not been at fault, but the workmanship in their manufacture should have been more thoroughly investigated. Take the common error of cutting quantities of oil grooves in the face of a plain bearing. Every oil groove in a bearing reduces the bearing area, not only by the amount of the area so removed by grooving, but also reducing the load-carrying capacity per unit of area of the bearing so grooved.

Examine some of these grooves and it will be found that the corners are so sharp as to become actual knife edges, cutting and destroying the necessary oil film, even though the best possible oiling mechanism is available to keep re-establishing the oil film. An oil groove should be well chamfered at its edges, so as to help the oil film to develop rather than to scrape the film from the journal.

Other Errors in Design

Again, consider the erroneous practice on the part of many manufacturers who, in order to save a small amount of money in the first cost of the bearing or bushing, recessed the back of the bushing so as to save the weight, thereby making the bushing thin enough in spots actually to weaken the bushing to a point where the load is not supported sufficiently. Thus the

*Secretary Lumen Bearing Co., Buffalo, N. Y.

actual supporting area of the bearing is materially reduced, frequently to a disastrous point, causing condemnation of the bearing material, when in reality it was a case of faulty design.

Examine the clearances allowed between the journal and the bearing. In many instances the allowance for oil films between the two mating parts is insufficient to permit a satisfactory film to be present, and consequently some part of the bearing is dry. Obviously, plain bearings or the materials therein get a black eye here, when, as a matter of fact, the design should be held at least partly responsible.

Such errors as the few outstanding ones mentioned above are not infrequent ones, and yet the bearings, if properly manufactured from the right materials, would have given satisfactory service.

It is true that, in the production of the modern plain bearing, not only the correct bronze must be present, but the bronze must have the proper crystal structure within it to be a fit mate for such steel journals as are now available and are coming into more and more common use.

Then, too, both the steel and the bronze must be accurately machined and, if they are to give the best results, they must be properly housed in the machine itself and held in place by such means as to preclude local pressure at any one point in the bearing, and thus avoid distortion.

Vital Factors in Design of Bearings

Designers who understand the application of modern steels to modern bronzes for such bearings recognize that many factors must be borne in mind. Among these are the following:

1. Accuracy of machining.
2. Proper allowance for oil film.
3. Proper oil grooving.
4. Consideration of the heat developed by friction, and its proper radiation and control.

These, of course, are the important factors after the proper materials have been decided upon for the service intended. Such factors as speed and pressure per unit of area are, of course, the prime ones. Obviously, these have been considered since engineering has been considering the design of bearings, but now that the users of a machine or other mechanical device expect to double or triple, or frequently increase by many fold, the production from a given machine, the factor of safety in such bearings can be increased only by the use of the best bearing material for the service in conjunction with the right kind of material in a journal mating with it.

Correct Manufacture Essential

Here enters the problem of the correct manufacture of the bronze for the service. A few years ago a bronze of a given analysis would have been considered satisfactory if the chemical analysis proved to be true to formula. Today not only the chemical analysis must be correct but the crystal structure must also conform to that best suited for the service intended. Makers of bearings and bushings should be equipped to handle a bronze so as to deliver a uniform crystal structure as well as a uniform chemical analysis.

Modern Worm Gears Cited

Look at the improvement in the service of the modern worm gear as a result of the control of the crystal structure therein, so as to mate with the hardened and ground worm, giving a resulting maximum of life. Here the punishment is frequently most extreme. Lubrication is frequently inadequate, yet such gears are proving eminently satisfactory for this service and are demonstrating conclusively that the relation between the crystal structure in the bronze and that in the steel must be carefully considered to give maximum satisfaction.

Crystal structure in bronze is important from the standpoint of life under bearing service, but is also important in such materials in other types of service. Witness the leaky valve or pump body, subject to hydrostatic tests, which, if cast of the identical alloy but having proper crystal structure would develop no leaks. Here, again, one sees the importance of scientifically controlled castings for modern industrial needs.

In the preceding remarks, in using the term "new bronzes" reference is made to bronzes as produced today. They may not differ in chemical analysis from those which have been made for many years but in uniformity of structure and uniformity of analysis they are far superior. In some cases the physical characteristics of the bronze may mean heat treatment; in others, the scientific control of temperatures or the scientific control of the cooling from the liquidus to the solid. The term "new bronzes" may also refer to new applications of the bronzes, which have been well known for years, but were considered too hard for service before the advent of modern steels and modern precision in machining.

Selecting the Right Bronze for the Service

No doubt, many readers of this article will ask what is the proper crystal structure for mating with a given steel and how can this be best determined? In the writer's opinion, this is a subject for specialists to decide and each individual case must have individual consideration. To make a decision of this kind it is necessary to know many details which heretofore have been somewhat passed over as negligible. Some of the factors that must be borne in mind today are as follows:

1. Horsepower transmitted by shaft.
2. Revolutions per minute of shaft.
3. Load per square inch of bearing area.
4. Character of workmanship in machining of journal and bearing.
5. Type of material and hardness thereof in shaft.
6. Is shaft to be ground to accurate measurement after hardening or not?
7. Kind of lubrication to be used.
8. Lubricating device.
9. Type of service (whether intermittent or continuous).

These and other minor factors all have much influence on the decision as to the right bronze for the service. Further, the question of impact in service is very important. It is thus apparent that the use and application of plain bearings have advanced today to a case where a specialist in their application is quite as essential as is a specialist in many other fields.

Conference and Exhibition of Industrial Advertisers

Industrial advertisers will hold their annual conference at St. Louis, June 11, 12 and 13, with headquarters at the Hotel Chase. The speakers include J. G. Pollard, Jr., Harvard Graduate School of Business Administration; Arthur E. Little, Thew Shoved Co., Lorain, Ohio; Sherman Perry, American Rolling Mill Co., Middletown, Ohio; John K. Blitz, Detroit Steel Products Co.; George C. Miller, president Dodge Mfg. Co., Mishawaka, Ind.; G. W. Morrison, Ingersoll-Rand Co., New York; and Fred R. Davis, General Electric Co., Schenectady, N. Y.

There will be an exhibition covering industrial advertising campaigns, placed in competition for eleven different awards.

The meeting is held under the auspices of the National Industrial Advertisers Association, of which H. von P. Thomas, Bussman Mfg. Co., St. Louis, is secretary-treasurer.

East Chicago Trains Apprentices

Chamber of Commerce Organizes Group of Manufacturers and Local School System Into Cooperating Unit—Desirable Students Rapidly Recruited

BY H. R. PACKARD*

ONE million young men should be in training in our industrial plants, according to the National Industrial Conference Board; yet less than 10 per cent of this number is now being trained through formal apprenticeship. Only a few establishments maintain apprenticeship programs, because only the larger ones can set up and maintain adequate training facilities. It is difficult to realize that less than one-half of one per cent of all manufacturing establishments employ over 1000 men; more than 85 per cent employ less than 100 men. Some plan must be evolved by means of which the smaller industries can participate and do their proportionate share of the training.

About a year ago the Chamber of Commerce of East Chicago, Ind., realizing the importance of such an industrial training activity, directed its attention to the evolution of an adequate plan for its industries. It was discovered that the "community plan" for training skilled personnel was not only feasible but that it had been proved a success in other districts.

Apprentices Attend Special Classes Weekly

With the beginning of the current year, paper programs were translated into realities. At the present time 85 indentured apprentices are at work learning the essentials of their respective trades and attending school one-half day per week for the related or technical training so essential in their apprenticeship. During this period, for which they are paid apprentice wages, they attend a high school class set aside for their particular needs and conducted by the vocational educational department of the local school system.

This "continuation" plan was decided upon as being the most practical and best suited to local conditions. Apprentices are indentured to individual plants and are schooled through the essential operations of their trade at actual shop work. This portion of the plan is continuous and is distinctly different from the "cooperative" plan of education, wherein the students work and attend school in alternate periods of equal length.

Thus the two essentials of modern trade training are adequately met. The manual or craft portion of their training is provided by detailed schedules of shop work covering all essential operations. The educational phases of the trade work, which cannot be provided on the job, are supplied by class room and study. An order of studies suited to each trade is carefully pursued. In general, these cover the following four main divisions: English, mathematics adapted to the trade, technical or related studies and, finally, a general division including shop economics, safety and hygiene.

An advisory committee administers this program. Its personnel consists of representatives from each participating plant and from the local school system. The policies and general direction of the program rest with this main committee. Various sub-committees are as follows:

Apprenticeship Administration Committee deals with training programs, not only within individual plants, but also a community program where details are common to all plants.

School Methods Committee is the link between the industries and the local school organization.

Shop Schedule Committee provides an interchange of apprentices wherever complete programs are impossible in any one plant, owing either to a lack of diversity or quantity of production and manufacturing operations. In this manner adequate shop schedules can be presented to every apprentice.

Wage Scales Committee has general jurisdiction over apprentices' rates of pay. Obviously it is essential that all establishments pay the same rate of pay in any given trade.

All prospective apprentices are interviewed by the apprentice training department of the Chamber of Commerce. A complete and adequate file enables us to provide young men, as apprentices are required in the cooperating industries. Routine machinery to arrange a school program satisfactory to both shop and school, the parents and the apprentices, has been set up by the Apprenticeship Administration Committee.

Interchange Between Shops Gives Rounded Experience

Unless adequate schedules of shop work comprising the essential operation of each trade are provided in any apprentice training program, it must of necessity fail sooner or later. To insure this in the East Chicago plan, ideal schedules for each trade were prepared. Each participating plant for those trades next prepared the schedule of operations best suited and possible to its own manufacturing operations. These schedules were then compared with the ideal to insure that no large discrepancies might creep into any individual plant program.

However, where it has been impossible for an individual plant to conform quite closely to the ideal schedule, interchange of apprentices has been agreed upon. Accordingly, the apprentice from such an organization will be able to complete his training in a larger plant in the community or at least in one which can provide such operations as are lacking in his original schedule.

The apprentice, however, is indentured to an individual plant and remains the employee of that plant throughout his apprenticeship. While at work in another plant participating in the program, he comes under the immediate jurisdiction of that plant and is paid by the plant for which he is working.

Apprentices are paid at a rate which insures the possibility of supporting themselves. Rates increase every six months until at the end of the four years' training the apprentice is receiving about 75 per cent of a mechanic's rate. Changes in these schedules, which differ slightly for the various trades, can be made only under the direction of the Wage Scale Committee, whenever such revisions seem necessary. All participating plants pay the established rates.

Grade School, High School or College Graduates Accepted

The minimum educational requirement which has been set is a grade school education. A boy leaving grade school must spend four years in trade training. A young man who has completed high school is given one year's credit and will therefore complete the same

*Secretary-manager East Chicago Chamber of Commerce, East Chicago, Ind.

shop schedule in three years. A college graduate must devote two years to the same program.

The program both as regards shop and school work has been prepared to meet the needs of these three classes, since the related school portion of this apprentice training is entirely on an individual basis. Each apprentice pursues a course of studies adapted to the trade he has entered, and he proceeds at his own pace unhampered. Instruction is devoted entirely to assistance and guidance for the individual. This is necessary, not only because of the varied previous educational experience, but also because apprentices must necessarily be inducted at any time throughout the year. The student is given 4 hr. per week on the employer's time for class room work; he is also required to spend an equal amount of time in home study.

All of the essential factors in this program are incorporated into an apprentice indenture or agreement, to which the employer and the apprentice, with his parents or guardians, are parties. The indenture sets forth in detail the shop and school schedules, as well as the rates of pay according to which the apprentice will work throughout his term of training. The employer agrees to provide employment approximately according to this schedule, and the apprentice is assured of employment regardless of business conditions, except in the case of complete shutdown. The apprentice and his parents in turn agree that he is to remain in training throughout the term specified. Each month the apprentice and his parents receive a report setting forth the shop and school grades attained.

Eighty-five apprentices now attend classes at the local high school. They are divided into five groups, one of which is in school Monday, another Tuesday, and so on, thus utilizing the teaching facilities to good advantage. Approximately 125 apprentices are employed in the eight manufacturing establishments now participating in this program. The extra 40 were previously employed and had progressed to the point where it was thought inadvisable to arrange for related classroom instruction.

More than 115 applications are on file in the Chamber of Commerce, a source of excellent recruits. Information about the plan is spread through the schools, parent-teachers' associations, and civic and social organizations in the community.

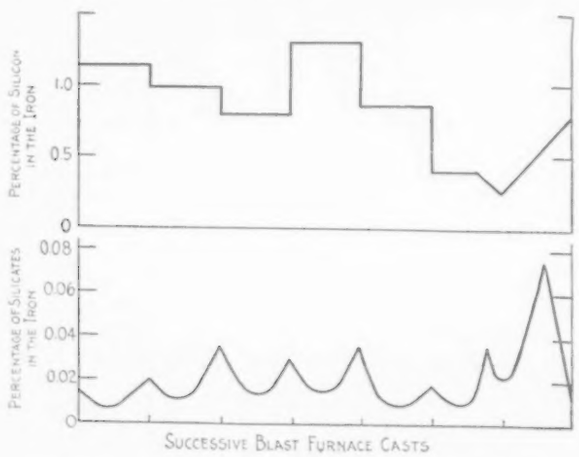
From a survey made about a year ago, it would appear that between 350 and 400 apprentices can be placed in training in the industries in East Chicago, on the present basis of employment. This maximum number will be approached gradually. New manufacturing establishments are being added to the program at intervals, thus allowing the administration of this plan to expand in a safe and reasonable manner.

The East Chicago industrial community has determined to place itself on a firm foundation as regards the skilled personnel necessary for its continued industrial well being. The plan as adopted by the Chamber of Commerce has some successful experiences in other communities to justify it. Some adaptation naturally was necessary to meet the needs of this community, but thorough preliminary study and careful organization has surmounted such difficulties as have arisen.

SOLUBILITY OF IRON OXIDE

Results of Special Heats Made to Check Up on Blast Furnace Conditions

AT the last technical session of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers, held at the Hotel Ohio, Youngstown, May 4, the discussion of open-hearth problems was closed by the presentation of an informal paper dealing with the solubility of iron oxide in iron and with the influence of changes in silica upon the silicates appearing in the iron.



Influence of Changes in Silicon Upon Silicates Appearing in the Iron

As foreshadowed at the Detroit meeting of the committee, several heats of steel have been made at the plant of the Bourne-Fuller Co., Cleveland, in which iron of greatly varying silicon content was used. Five heats were reported by C. H. Herty, Jr., two with iron at about 1 per cent silicon, two in which the silicon was coming down to a low figure, and one at about 0.30 per cent silicon. These were rolled into billets and rounds and into galvanized sheets, the latter including some from the low-silicon iron as well as the normal.

It was found that, so long as the silicon in the pig iron remains approximately uniform, good results are obtained in the steel. When a change occurs in the blast furnace, however, resulting in a change in the silicon content, up come the silicates in the iron. This occurs whether the silicon content of the pig iron is increasing or decreasing. And the good results come with uniform silicon, whether it is high or low.

Very little trouble is experienced in open-hearth practice, according to Doctor Herty, unless the iron gets above 0.10 per cent in silicates. All of the steel made from these special heats was rimming steel of about 0.10 per cent carbon and 0.40 per cent manganese. On the low-silicon irons the slags were much higher in iron oxides all the way along the heat.

Four of the heats were made in about 11½ hr. each. The last one, from the low-silicon iron, took 17 hr. Doctor Herty expressed the opinion that, for 0.10 per cent carbon steel, the iron oxide in the slag ought not to run over 22 per cent. He stated that an addition of 200 deg. to the furnace temperature would get rid of three-fourths of the iron oxide content in the slag or in the steel.

Second International Conference on Bituminous Coal

Eleven different countries, represented by 60 to 70 scientists and fuel technologists, are expected to participate in the second international conference on bituminous coal. This will be held at the Carnegie Institute of Technology, Pittsburgh, in the week of Nov. 19. The list includes about 40 men from Europe, including England, France, Germany, Italy, Austria, Denmark, Belgium and Russia. Japan and Canada will be represented also.

The forty-eighth annual dinner and meeting of the Cleveland Engineering Society will be held June 12. The principal speaker will be Elmer A. Sperry, president of the Sperry Gyroscope Co., Brooklyn, whose subject will be "The Engineering Contributions of the Gyroscope."

Powdered Coal in Steel Furnaces

Thirteen Years' Experience of Eastern Steel Co.— Between 500 and 600 lb. Per Ton of Ingots and 200 Heats to One Roof

THE use of pulverized coal in basic open-hearth furnaces, covering the experiences at the plant of the Eastern Steel Co., Pottsville, Pa., was discussed in a brief paper contributed to the Pittsburgh meeting last month of the American Society of Mechanical Engineers by E. L. Herndon, receiver for the Eastern Steel Co. The experience supplies the record of 13 years' use of the fuel without any word of advocacy or otherwise for such a plant. What discussion developed on the presentation of the paper left the impression that pulverized coal for the metallurgical furnace had no particular friends among those at the Pittsburgh meeting.

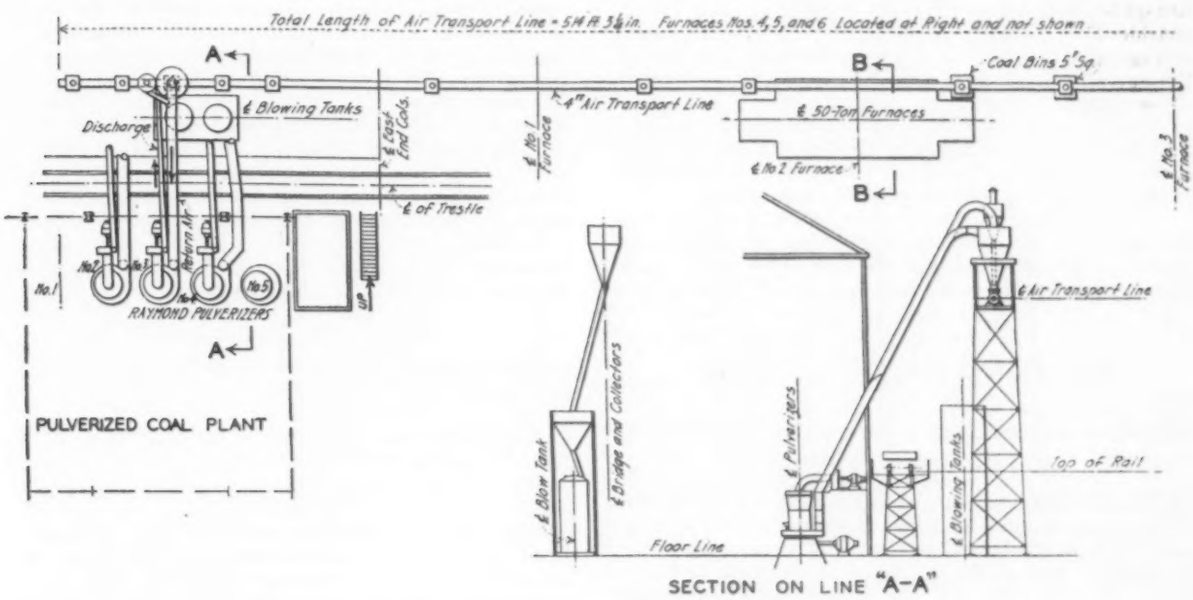
However the facts and figures of the case were generously contributed by Mr. Herndon, as shown in the following, which is the paper substantially in full. The use of the powdered coal, the author mentioned at the outset, came about as the result of the continued advance in the price of fuel oil.

The open-hearth-furnace plant consists of four 50-ton furnaces and two 80-ton furnaces. All have basic bottoms, all are stationary, and all are of the ordinary design.

When the pulverized coal was first used in the furnace, it was found that the checkers were filling up with ash. It was realized that this could not be prevented, and therefore arches were substituted for the checkers because of the greater space. The arches are placed about 18 in. apart in rows, one above the other, with about 3 ft. between the rows.

The furnaces are reversed by two dampers, one placed in each flue between the checker chamber and the stack. This gives the products of combustion a direct path to the stack.

The slag pockets are equipped with removable structural-steel boxes which fill up in about 15 days. The time ordinarily required to pull two boxes and get the fuel on the furnace again is about 5 hr. The boxes used for the 50-ton furnaces are 15 ft. x 10 ft. x 2 ft. 5 in. deep; for the 80-ton furnaces, the dimensions are


Total Length of Air Transport Line = 514 ft 3½ in. Furnaces Nos. 4, 5, and 6 Located at Right and not shown
A
B
Coal Bins 5' Sq.
℄ Blowing Tanks
Discharge
℄ East End Cols.
4" Air Transport Line
℄ 50-Ton Furnaces
℄ No. 1 Furnace
℄ No. 2 Furnace
℄ No. 3 Furnace
℄ of Trestle
No. 1
No. 2
No. 3
No. 5
Return Air
RAYMOND PULVERIZERS
PULVERIZED COAL PLANT
℄ Air Transport Line
℄ Bridge and Collectors
℄ Pulverizers
℄ Blow Tank
℄ Blowing Tanks
Top of Rail
Floor Line
SECTION ON LINE "A-A"
Operators' Platform
Capacity Coal Bin = 360 Cu. Ft.
Coal Bin
Capacity Lower Section = 42 Cu. Ft.
Capacity Nose Piece = 4 Cu. Ft.
Floor Line
SECTION ON LINE "B-B"
Bin Capacity 30,000 Lb.
Crane Girders
THIS SECTION OF BIN ON NOS. 1, 2, and 3 FURNACES ONLY.
1¼" Coal
Line of Fore Plate
¾" Air Line
LONGITUDINAL SECTION SHOWING COAL BINS WITH RELATION TO 50-TON FURNACES

Coal Pulverizing Plant Is at One End of the Open-Hearth Plant and the Coal Is Carried by Compressed Air to Bins at the Furnaces

18 ft. x 10 ft. x 2 ft. 5 in. All four sides of these boxes are tapered, and the boxes are lined with a 9-in. lining of old bricks laid up in common clay.

Each furnace is supplied with two storage bins for pulverized coal, which have capacity sufficient to operate a 50-ton furnace for 18 hr. and an 80-ton furnace for 15 hr. The coal is supplied to the furnace from the bins by compressed air siphons. On the 50-ton furnaces the air jet is ⅜ in. in diameter and on the 80-ton furnaces, 9/16 in. in diameter. The air pressure used is 80 lb. per sq. in.

Each furnace is supplied with the necessary equipment for using fuel oil in case of emergency. The oil supply is stored in the usual way, in a tank of considerable capacity, and is at all times on tap.

The plant for pulverizing the coal is situated near the end of the open-hearth building. Preparation of the coal consists of crushing, drying, and grinding. At various times lump, run-of-mine and slack have been used. The equipment consists of three Raymond five-roller mills and one Raymond four-roller mill. Each mill is connected to a motor. There are in addition two Cummer driers and one Jeffrey single-roll coal crusher.

When the coal is received, the railroad car is placed over a pit and the load dumped into the pit. From this it is hoisted to the top of the building, a height of about 100 ft., by an Otis automatic dump-bucket elevator. There are two buckets, which are operated in the manner of the usual blast-furnace skip.

When it reaches the top of the skip, the coal is dumped into a storage bin which has a capacity of about two carloads; thence it passes to the crusher, located directly below the bin. The crushed coal is dropped into another bin for storage before sending it to the driers. The compartments for storing dried coal are quite small because it is thought unsafe to keep any considerable quantity of dried coal in storage. Each storage compartment is situated directly over one of the pulverizing mills, and the height of the drier above these compartments is just sufficient for a steel tube to lead to each individual compartment so arranged that there is no possibility of holding any considerable amount of dried coal over the mill. The coal is ground to pass 80 per cent through a 200-mesh screen.

After the coal has been pulverized, it is conveyed to the furnaces by a Quigley compressed-air system. There are two steel tanks, each tank permanently fixed upon a scale by which the coal is weighed. The dial on the scale shows the amount of coal in the tank when it is being filled, and also shows the amount when the coal is being discharged, so that the readings show the weight of the amount taken to the furnaces. Compressed air is used for transporting the pulverized coal through a 4-in. pipe which connects the tanks just mentioned with the coal boxes over the furnaces. The distance from these tanks to the box at the farthest furnace is 450 ft. Each furnace supply box is furnished with a valve so that any box may be refilled as needed.

At a 12-in. mill located at about the same distance from the tanks as the farthest open-hearth furnace, pulverized coal is used in a continuous furnace. The same method of transport is used for this supply.

The average analysis desired for coal suitable for pulverizing for open-hearth purposes is about as follows: Volatile, 36 per cent; fixed carbon, 52 per cent; moisture, under 1.25 per cent; ash, 6 to 8 per cent; sulphur, under 1.25 per cent.

The operation of the open-hearth furnaces does not now present more difficulty than with producer gas, though it is not as simple as with oil. All-cold charge is used, and the time for charging is about 4 hr. The scrap is, in general, quite light and the percentage of pig iron is kept as low as possible because of cost. One heat in 12 hr. is considered as 100 per cent, and it is usually possible to keep fairly near this through the campaign. The life of furnaces is about 200 heats for one roof. Usually a second roof can be put on without disturbing any other part of the furnace, and then an additional 100 to 150 heats can be obtained with this second roof.

The coal required runs as low as 500 lb. and as high as 600 lb. per ton of ingots. The wide variation is partly due to character of coal, partly to the charge, to the analysis required in the product, and a little to the age of the furnace, although the time from tap to tap varies less than was formerly thought possible. The temperature maintained in the furnaces is essentially the same as that with producer gas.

There have been infrequent explosions, one in which one life was lost and considerable damage to property resulted. The others were not of consequence. The cause of the serious explosion is not known, although reasonable theories and some conjectures are held, but no proof. The experience during thirteen years does not seem to indicate extra-hazardous occupation.

WELDING ON BUILDINGS

Detroit Architect Speeds Erection with Welding and Cutting Equipment

WELDING of structural steel was discussed by Joseph Matte, Jr., of Albert Kahn, Inc., Detroit, at a meeting of the Cleveland section of the American Welding Society held at the rooms of the Cleveland Engineering Society, May 31. He cited various operations which, because of more rapid work and reduced costs, could, in his opinion, be done more advantageously by arc welding than by riveting. Field work, he said, offers opportunities for the larger welding operations, since many structural conditions are best met by that process. In a little while, he believes, there will not be many structural jobs on which an arc welder is not employed.

Comment to the effect that welding in its operation is in about the same place as riveting was 20 or 30 years ago was made by J. F. Lincoln, vice-president and general manager Lincoln Electric Co., Cleveland, who also predicted that great progress will be made in this industry.

Mr. Matte said that one of the most common objections to welding is that it depends on the human element and is not subject to inspection like riveting. However, there has not been a single failure of welding in the structural field. Welders use a factor of safety of five, and welds have been made that carry loads up to 600,000 lb. in shear. While the human element has much to do with welding, the same is true of the manufacture of the best steel. To assure good work the supervisor of welding must be a welder and should test the ability of his men, so that no one insufficiently trained is put on the job. In addition, numerous safeguards can be provided. Good welders can be secured as well as good riveters.

Some structural jobs require welding, declared the speaker. Referring to specific operations, he mentioned the erection of a large house having a complicated hip and valley roof with intricate framing. Drawing up elaborate details would be a waste of time. Instead, he would have the various sections cut to mill lengths and the welder would do the job about the way a carpenter would if wood construction were used. The real way to attach bar joist floor supports to the steel structure is by welding. The right way to build a steel swimming tank is to weld it, he said. Welding and cutting is of great assistance in factory construction for placing mechanical equipment and pipes.

Another place where welding fits in, said Mr. Matte, is when the owner of a building under construction decides on changes, which would stop the work and require new drawings and new shop fabrication. With the application of welding, beams of the right length are sent and welded in the field, an the job goes right along without delays. Mr. Matte spoke of one building where new elevators are being put in, new mezzanine floors are being erected and other changes are being made, all the work being welded.

Production of electric power by public utility power plants in the United States in April is reported by the Geological Survey at 6847 millions of kwhr. This compares with 7234 in March and with 6871 in February. It was about 5 per cent ahead of last year. Waterpower provided nearly 43 per cent of the total, against 39 per cent in March.

Power and Other Steel Mill Problems

Waste-Heat Boilers, Power Plant for Steel Mills and Basic Open-Hearth Practice Discussed by American Iron and Steel Institute

ABSTRACTS of two of the papers read at the spring meeting of the American Iron and Steel Institute, New York, May 25, are given below, supplementing the abstracts of three of the papers published in THE IRON AGE of May 31. There is also published on the following pages the discussion of Dr. George B. Waterhouse's paper, "Basic Open-Hearth Steel Practice" (abstracted last week), offered by Carl W. Peirce, until recently open-hearth superintendent Empire Steel Corporation, Mansfield, Ohio, and also some of the discussion offered by H. B. Hubbard, superintendent, open-hearth department, Inland Steel Co.

Waste-Heat Boilers in the Steel Mill

BY R. H. STEVENS

OUTSIDE of a few instances, the steel industry paid little attention to conservation of waste heat until about 15 years ago, when it made a determined start to recover the enormous losses in coke-making, and to conserve heat wasted at almost all kinds of furnaces, by installation of waste-heat boilers, recuperators, etc. Of course, the waste-heat boiler had been in use for many years on puddling furnaces as the principal supply of steam for rolling and hammering the puddled iron.

[Consideration is given by the author of gas temperatures involved, composition and heating value of the gases, proper location of the boiler (s) with relation to the open-hearth furnace and the electric power-generating plant, steam pressures obtainable, possibility of explosion at valve reversal, fans for draft, superheaters and economizers, air infiltration, draft requirements, heat losses and type and design of boiler.]

It is no doubt apparent that the foregoing presentation has been based entirely upon conditions existing in the manufacture of steel and that the conclusions formed apply more particularly to that industry.

Reclamation vs. Improving Primary Unit

Periodically, in the past, we have been confronted with the reclamation problem in some form or another. Generally the first conclusion has been to install something directly for reclamation; whereas waste reduction by improving the primary unit becomes a consideration only after repeated failures at reclamation. Some years ago, smoke consumers engaged the attention of many engineers and for a while seemed destined to reimburse the manager for the losses from poor combustion.

At one time, instead of trying to reduce the coke consumption per ton of pig iron, it was considered wise by some to increase this amount, so that more blast furnace gas would be available, and thus return a profit in excess of the expenditure. The low-pressure steam turbine, in conjunction with wasteful high-pressure reciprocating engines, was once to be the true remedy for steam power wastes. Within a comparatively short time, all of these proposals have been advocated, applied and displaced by a reversion to the primary unit and the development of its possibilities.

To Obtain Better Economy

These incidents indicate that increased economies most likely can be obtained by improving the primary unit, and when that fails, the primary unit itself must be displaced. Extraordinary savings effected by a waste-heat boiler might well be accepted as a warning to improve the combustion or furnace design rather than as a cause for rejoicing.

Generally speaking, when the steam generated by the recovery of heat is returned to or utilized by the primary unit, the waste-heat boiler can possibly be advantageously and economically used. But when the steam so generated is not thus required, or when it is in excess of those demands, study of the returns from such installation costs is very apt to decide against such recovery.

Conclusions

1—While the generation of steam is in general a very feasible way of recovering waste-heat energy, an installation for the purpose is apt to be one of the most expensive, and the ultimate results no better than those possible with a less costly scheme.

2—Metallic recuperators are now capable of receiving the hot burned gases as high as 1600 deg. Fahr., or higher. This seriously affects the justification for waste-heat boilers and, when used in connection with regenerators, may exclude the necessity for installing a steam generating unit.

3—Increased knowledge and more careful observation of the laws of heat generation and absorption apparently lead to the elimination of divided or multiple systems of heat utilization, to effect maximum economy.

4—Complete utilization of heat by the primary heating unit promotes economies in excess of those represented by the performance of the boiler.

5—Apparently the field wherein the waste-heat boiler can make the best showing is the one wherein the reclaimed energy is not required directly by the process from which it came.

Comparison of Results in Practice

Five operating installations, figured from actual yearly results and costs, were compared, by W. N. Flanagan, Carnegie Steel Co., in discussing Mr. Stevens's paper. These waste-heat boiler plants were equipped as follows:

I—Fifteen horizontal fire-tube boilers, with small economizers.
II—Two Yarrow boilers with large economizers.
III—Twelve Babcock & Wilcox boilers, with no economizers.
IV—Twelve Stirling boilers with no economizers.
V—Ten Erie City boilers, with no economizers.

Of these five groups, the fire-tube boilers gave the greatest output of steam to the ton of steel made and the greatest output for each million B.t.u. furnished them. They showed 31.6 per cent of the fuel returned

IN 1888 R. H. Stevens entered the machine shop of the Edgar Thomson plant of the Carnegie Steel Co. at Braddock, Pa., as an apprentice, serving until 1891, when he entered the drawing room of the Homestead Steel Works of the same company. In 1898 he became assistant mechanical engineer and in 1902 chief engineer, which position he held until he became chief engineer of the Midvale Steel & Ordnance Co., at Philadelphia, in 1915. This position he retained, except for one year as works superintendent at Coatesville, Pa., until 1923, when the Bethlehem Steel Co. took over the Cambria plant. Then he was transferred to his present position, that of chief engineer of the Bethlehem company at Johnstown, Pa.

as steam, against an average of some 22 per cent for the others. Their initial installation costs, based at 100, compared with much higher costs, up to 260, for the others. Their total operating costs, again at 100, were compared with 236 for the best of the others, and 286 for the poorest.

Steel Works Power and Blowing Plant

BY WILFRED SYKES

IN 1923 the Inland Steel Co. began construction of a new power and blowing plant adjacent to the blast furnaces, to use the blast furnace gas to better advantage and to supplement the existing electric supply. The newer mills were electrically driven, power being obtained from a 20,000-kw. turbo-generating station, supplied with steam from coal-fired boilers. Extensive additions were then being made to the plant and electrification of the older steam-driven mills was contemplated.

There were installed three 12,500-kva. turbo-generators and five turbo-blowers for the four furnaces. In addition to supplying a. c. power for general plant use, the station also supplies direct current for the operation of the docks, blast furnaces and coke plant. For this purpose four 1000-kw. 250-volt rotary converters were installed.

[After detailing, with illustrations, the principal features in the new development, the author gave a series of interesting figures as to operating results achieved. His table showing operating costs for 1927, with some additions made in his oral presentation, appears at left.]

Total power generated		172,676,400 kwhr.
Total power cost		$761,826
Pig iron produced, gross tons		811,417
Total cost of blowing		$397,895
Cost of blowing per ton iron produced		$0.49
Credit for gas used from blast furnaces at power house	$956,925	
Credit for gas used under boilers for steam used for other purposes	$105,585	
Total credit to blast furnaces for gas		$1,062,510
Credit per ton iron produced		$1.31
Net credit to blast furnaces, after deducting cost of blowing		$0.82
The gas credit to the blast furnaces was based on being the equivalent of 278,874 tons of coal, the value of which was $3.81 a ton.		
Average operating cost per kwhr		4.41c.
Capital cost per kwhr		1.91c.
Total cost per kwhr		6.32c.

Economies Along Several Lines

In discussing Mr. Sykes's paper, O. Needham, Westinghouse Electric & Mfg. Co., pointed out the great economy in erection of the Inland plant, costing $58.50 for each kilowatt of installed power, against $80 to $125 for installation costs in public utility stations.

He called attention, also, to the considerable reductions in weight of turbo-generators and other units as now made, compared with the practice of only a few years ago. As much as 30 per cent of the total weight of a turbine is cut off, due to the use of welded members, instead of castings, for frames and other parts.

*Quality Factors in Basic Open-Hearth**

BY CARL W. PEIRCE

YEAR by year the demand for better steel has been growing stronger but never have the products for which it was made required the care in the steel plant that they do today. The advent of the motor car and airplane, the use of high-speed tools and a thousand different uses call for steel able to withstand heavier dynamic strains. We live in a specialized age. The users of steel, being in close competition, are constantly adopting new practices in fabrication which subject the steel to harder and harder treatment. Day by day the steel manufacturer is confronted with the problem of doing something to meet this new demand.

This discussion will be confined to the three points, (1) the charge, (2) the working and (3) the casting of the heat, emphasizing the need of more supervision and closer attention to details.

The Charge

QUALITY steels cannot be made from inferior raw materials. In making up a charge for a basic heat, materials of a known composition should be used, to avoid soft and raw melting heats. When a heat is properly charged it is half made. A charge which melts soft, or high and raw, is apt to show defects in the finished product, no matter how carefully it has been worked. For this reason, the utmost care should be

*Discussion of paper by Dr. G. B. Waterhouse on "Basic Open-Hearth Steel Practice."

EDUCATED at Melbourne University, Melbourne, Australia, in electrical and mechanical engineering, Mr. Sykes was engaged in engineering work in that country from 1901 to 1906. From 1907 to 1909 he was employed as an engineer by the Allgemeine Elektricitäts Gesellschaft in Berlin, Germany. He was an engineer with the Westinghouse Electric & Mfg. Co., East Pittsburgh, in 1909 to 1920, in charge of steel mills and other engineering work. He was also an engineer with the Steel & Tube Co. of America from 1920 to 1922, and has been with the Inland Steel Co., Chicago, from 1923 to the present time. He is now assistant general manager of the company.

used in properly proportioning the materials making up the charge. Materials unloaded in the stock house should be segregated according to their analysis and physical appearance.

A definite amount of carbon in the charge is necessary to melt and refine it. Less than this gives a soft melting heat and an inferior product; more than this requires extra time to reduce, with the added danger of over-oxidizing the metal while doing it. Uniform charges containing a definite amount of each material should be used, with the proportion of iron and scrap to be governed by the speed and working of the individual furnace.

Sulphur and phosphorus can be removed from the bath in small amounts only, so that care should be used in limiting the quantity going into the charge. In one open-hearth which uses a large amount of machine shop turnings, a sulphur determination is made of each car before it is placed in the stock house, and a set amount of high-sulphur turnings is used in each heat, the stockhouse foreman keeping the number of pounds of sulphur below a given amount. In this way, 95 per cent of all heats finish below 0.030 per cent sulphur.

Too high a percentage of silicon in the pig iron being the main cause of high and raw melting heats, the amount going into the charge should be closely watched. Where cold iron is used it should be segregated according to its silicon content in at least three piles. The large pile would contain all iron ranging from 0.85 to 1.15 per cent silicon, the other two, all casts below 0.85 per cent and above 1.15 per cent. In loading for a charge, the greater amount should be taken from the 0.85 to 1.15 per cent pile, with a magnetful or two from each of the other two piles to keep them balanced.

Keeping Tabs on Mixer Iron Characteristics

In open-hearth furnaces where hot metal is used, a silicon and sulphur determination of the mixer iron should be figured after each cast from the blast furnace is poured in. This is done on the basis of averages. Over a considerable space of time mixer men have been able to check with the laboratory within seven points of silicon and three of sulphur.

Adding	Units
100 tons in mixer of 1 per cent Si=.....	100
100 tons from blast furnace of 0.75 per cent=	75
200 tons into.....	175=
	0.875 per cent Si.

The sulphur content is averaged the same way. When the next cast from the blast furnace arrives, the amount of metal drawn out since the previous cast is subtracted from the 200 tons, the remainder multiplied by 0.875 per cent and the new cast and analysis added as before, checking the analysis once a day with the laboratory. To carry out this practice, the iron samples from casts should go promptly to the laboratory, to permit the analyses to reach the mixer shortly after the cast.

This arrangement gives the melter accurate knowledge at all times of the mixer iron. When the silicon runs abnormally low, the scrap should be reduced and extra iron added. As the silicon increases above 1.10 per cent, the amount of hot metal should be reduced and, when reaching 1.30 per cent, can be cut 8000 or 10,000 lb. on a 100-ton charge. By following this practice more uniform melts, with a proportionate increase in tonnage and a better quality of product, are produced.

Working of the Heat

IN setting the specifications on steel, engineers have fixed on carbon, manganese, sulphur and phosphorus as the principal elements which determine the class of the steel. The effect which a small amount of carbon has is one of the wonders of metallurgy. The whole range of steel products from the softest sheet to that of files and cutlery can be made by the combination of not to exceed 30 lb. of carbon to the ton of steel. Manganese, because of its hardening and toughening qualities and its ability as a scavenger, is important. Sulphur and phosphorus, elements detrimental to the physical properties of the steel but in some cases useful, are given fixed limits. Another element omitted from the list, but having a very determining effect on the quality of the steel, is oxygen. Composing nearly one-half of all matter, oxygen is the cause of many of the slag inclusions and cavities and blowholes in the ingots.

Great Affinity of Oxygen for Iron

Not enough consideration in the open-hearth is given to the metallurgical law that "oxygen combines readily with iron at all temperatures," and, of course, the higher the temperature the more rapid the combination. One of the chief causes of inferior heats from the open-hearth is that these heats are worked and tapped too hot, for at high temperatures iron has a stronger affinity for oxygen than does carbon. That this is true, open-hearth men agree, since it is known that a heat worked down hot will take twice the amount of ore to reduce the carbon as one worked cooler, the oxygen from the extra ore remaining in the steel as an iron oxide.

In working a heat with a charge containing sufficient carbon to permit the use of ore, the air and gas should be cut back as the line is coming up, to give a reducing instead of an oxidizing flame, and to keep the metal from getting too hot. Only enough flame should be kept in the furnace to keep the bath in a good boiling action. When the line is free from the bottom, and the heat ready for ore additions, the flame should be further reduced. The feeding of ore should be stopped while the carbon in the bath is still high enough to permit the proper shaping of the slag and attaining the correct pouring temperature. A creamy slag, rather than one too heavy or too thin, with plenty of action to the bath, is to be desired, with a tapping temperature that will leave a saucer skull in the bottom of the ladle.

To illustrate better the importance of a proper charge and the working of the heats in making good

steel, I wish to relate an experience of some 14 years ago. The open-hearth shop in which I was a foreman was shut down, and I was sent to the other open-hearth as a practice inspector. It was the policy in this shop to charge the heats to melt close. The superintendent gave as his reason for this that it saved the time of feeding ore, and the extra "drink" of metal which many heats took increased the tonnage. When the quality of the steel was questioned, he did not think it made any difference.

Acting on this suggestion, during my spare time I went over the charge sheets of all rail heats, 1338 in number, made during a period of seven months. Rail heats were taken as a basis because on this type of steel it was possible to get an accurate report of the faulty steel produced. Heats that melted soft, requiring an extra drink of metal for finishing, averaged 7.1 per cent second and condemned rails, against 4.2 per cent of those using ore in the working. The report also disclosed that heats melting close, using neither ore nor extra metal, averaged as high in defective rails as those melting soft, because the furnacemen had handled their furnaces in both cases the same.

Effect of Skulls and Molds Charged

In compiling this report several interesting points were developed. Of 95 heats finishing over 10 per cent seconds, 53 melted soft, 16 were soakers or burn-out heats where brick repairs were made to the furnace while the gas-house flues were burned out, and 13 had broken molds and blast furnace ladle skulls of more than 30,000 lb. each. Of 39 heats losing the top rail or more, on account of pipe or breakage at the drop test, 15 melted soft, seven had molds and blast furnace skulls of more than 30,000 lb. each and two were soakers or burn-out heats. On one whole heat, rejected on account of the drop test, the entire iron part of the charge was made up of molds and blast furnace skulls: four molds, 27,500 lb.; broken molds, 35,260 lb.; blast furnace skulls, 15,760 lb.

Perhaps the most interesting point brought out was the difference in the quality of the steel as made by different furnacemen. A list of consecutive rail heats made during the same period on one furnace whose helpers worked their heats very hot, and used probably twice the amount of ore necessary, ran six times as high in defective rails as those made on another furnace, whose helpers worked their heats cooler and were more careful about their slags and tapping temperatures.

Furnace No. 6		Furnace No. 10	
Seconds, Per Cent	Condemned, Per Cent	Seconds, Per Cent	Condemned, Per Cent
22.1	3.5	0.0	0.7
5.6	0.0	0.0	0.0
2.1	25.7	0.0	0.0
13.3	2.8	0.0	0.0
1.6	0.0	0.0	0.0
1.4	0.0	0.0	0.0
7.4	0.7	3.1	0.0
0.8	1.5	1.1	0.0
2.5	0.0	1.2	0.0
0.7	0.0	1.8	0.6
3.3	2.6	3.5	0.6
15.0	2.5	0.0	0.6
8.3	3.0	5.3	0.0
3.0	1.5	2.7	0.0
14.2	0.7	1.9	1.9
3.3	0.0	4.4	0.9
5.3	0.0	3.3	0.8
22.6	11.3	0.0	0.0
0.8	0.8	0.0	0.0
0.0	0.7	0.8	0.0
2.3	0.8	0.0	0.0
14.5	0.0	1.5	0.0
13.0	1.5	0.0	0.0
4.3	0.7	1.2	0.0
8.3	0.6	3.6	0.6
1.7	0.6	0.7	0.0
1.3	0.0	0.0	0.0
13.9	2.9	0.0	0.0

In the larger open-hearth plants it has been customary to have two melters on each turn, handling six or seven furnaces each. If an extra melter were added to each turn, giving each man charge over not more than four furnaces, better supervision could be given to the temperatures and working of each heat. The melter would then have time for observing his steel as it was being poured, and could give more attention to repairs to bad bottoms—one of the principal causes of bad heats. On a monthly output of 60,000 tons or more, the added expense for the three extra melters would be less than 3c. a ton, which could be saved many times by the better quality of the steel and the general operation of the furnaces.

Casting of the Heat

IN general, throughout the United States, not enough attention has been given to the proper handling of the steel after it is tapped into the ladle. Care is given to a proper charge going into the furnace, and to the working of the heat, and high-priced deoxidizers are used to finish cleansing the steel. Then it is tapped into the ladle and sent to the platform for a foreigner to pour. Molds often are placed at the pouring platform only a few minutes before being used, no time being given for inspection or cleaning. Much more attention is given to this part of the work abroad than here.

In a paper read before the (British) Iron and Steel Institute in May, 1918, by J. N. Kilby, entitled "Causes of Defects in Steel Ingots," the author states that "teeming speed is the most important factor at any time in the process of steel making," and that top-pour ingots can be made as free from cracks as bottom-pour, provided the same length of time is taken to pour them." In another place, commenting on the practice in one open-hearth of pouring a 7200-lb. ingot in 1 min., he gives it as his experience that, if ingots of this size are poured in less than 3 min., 80 per cent will show cracks at rolling, and that the safety line is actually 6 min. He gives a table showing the effect of slow pouring of ingots of 5600-lb. weight from 40-ton heats.

Time in Minutes	Ingots Cracked in Mill, Per Cent	Bars to Chip
2	100	Nearly all
3	50	40 Per Cent
3½	40	30
4	10	8
5	5 slightly	4
6	2 very slightly	2
7	Nil	Nil

He does not state how these ingots were poured, but from the length of time consumed it is evident that most of them were either bottom-cast or through secondary ladles. Mr. Kilby also gives it as his experience that teeming speed is really of greater importance than temperature; that heats alleged to be on the hot side may produce ingots free from cracks, provided the period of filling the ingot be prolonged to the correct extent by the use of correct nozzles or secondary ladles; that the casting of heat after heat with a slight skull left behind, at the same time getting cracked ingots at the mill, points to the great importance of correct teeming speed.

Advantages of Slow Teeming

Experiments in different plants in our country point to the same experience. Slow pouring allows the metal to cool and free itself of gases, giving better rolling qualities and a superior grade of product. In an experiment carried on in the American Rolling Mill Co. in 1926, ingots of different lengths and with various speeds of pouring were cast from the same heat, and then split to determine the location of the blowholes. In the ingot poured to full length and at normal speed, the blowholes came up about 28 in. and were on the average ¾ in. from the surface. The blowholes in the ingot slowly poured, to full length, came up to the same height, but were from 1 in. to 1¼ in. from the surface.

In another open-hearth plant in which considerable trouble was being experienced with pipe in the rail steel, the A-rails of all heats cast on one 12-hr. turn being lost, the suggestion was made to hold the heats in the ladle 5 min. before opening. Instead of doing this, 5 min. extra time was taken in pouring the heats, 15 sec. being taken to pour the last foot of each ingot. The pipe trouble disappeared.

The size of pouring streams has been gradually reduced for the past 20 years. From a 2¼-in. stream on heats of 30 to 50 tons, many plants are now using 1½-in. streams for heats of 100 tons. One plant is using 1⅜-in. streams for casting soft steel of 100 tons and, with a temperature which will leave a saucer skull, heats are poured cleanly, averaging 65 ingots each.

The use of this size nozzle instead of the 2-in. increases the pouring time of each ingot 112 per cent; over the 1½-in. nozzle, 20 per cent.

Good Practice Demands Clean Molds

Another important detail to secure better ingots is attention to clean mold condition. Molds should be warm, insuring that they are dry, and should be wire brushed and graphited before being used. All cracked molds which will make a fin on the side of the ingot should be scrapped. To guarantee a straight stream that will not hit the side of a mold, a piece of gas pipe with an insert which fills the nozzle hole, and extending up through the goose-neck, should be used while the nozzle is being tamped. In casting, the nozzle should be long enough to permit the pourer to open up and pour the first foot of the ingot slowly, without having a spreading stream.

The use of magnesite nozzles for pouring low-carbon steel, to eliminate the excessive erosion incident to the employment of fire-clay nozzles, is recommended by one foreign writer who states that, with this type, the rate of casting progressively decreases from the first to the last ingot, because the nozzle does not erode and the head of metal in the ladle grows constantly less. I do not know that this type has been used in this country, but that there is a demand for such a nozzle no one will deny.

Other Departments May Bear Watching

Nor should the close attention to details be confined to the open-hearth department. Some heats of steel, because of a poor charge, will produce only a fair ingot, although the utmost care has been given to the working and casting of it. Many of these heats are made practically worthless by being washed in the soaking pits, and reduced too rapidly in the blooming mill. An inspector checking and reporting on the temperature and condition of ingots as they are drawn from the pits will pay big dividends in producing cleaner steel.

At the blooming mill, the number of passes which is given an ingot should depend on the quality of the ingot, and not on the amount of tonnage to be produced that turn. If the ingot shows a tendency to tear, the draft of the first few passes should be reduced until the ingot has a solid surface. Here, again, another inspector.

Tilting Furnaces

Because of their valuable assistance in controlling the working portion of the steel-making operation, tilting furnaces are exceptionally useful. Doctor Waterhouse brought this out clearly in his paper. Not only is the tilting furnace of great metallurgical value in permitting flushing off early slags, full of impurities from the charge, but it has large mechanical advantages as well. Holes developing on the banks may be uncovered readily and patched up with the greatest ease in a tilting furnace, with but a fraction of the delays occasioned by the same incidents in stationary furnaces. The furnace may be overcharged without the same danger of breaking out. The furnaceman has always at his hand the possibility of working a recalcitrant heat as his judgment, metallurgically, dictates, without being handicapped by considerations of close limitation on the amount of additions he can make to his bath.

Discussion by Mr. Hubbard

H. B. Hubbard, superintendent open-hearth department, Inland Steel Co., noted the following developments which were improving the furnace efficiency: The sloping back wall, larger uptakes, the suspended roof, and basic materials used in walls and roofs. In his opinion, many heats were melted with too much lime; this was supposed to cover a multitude of sins in dirty scrap. Usually it would be better economy to segregate the scrap better and throw the bad stuff back on the seller.

FACTORY TRANSPORTATION

Overhead and Ground Conveying at Westinghouse and General Electric Plants

THE materials-handling activities of the Westinghouse Electric & Mfg. Co. were described in a paper presented at the Pittsburgh meeting of the American Society of Mechanical Engineers by C. A. Fike, supervisor of transportation of the Westinghouse company at East Pittsburgh, Pa. The paper dealt with system developed under Mr. Fike's direction, detailing methods of control, the wage-incentive plans used in payment of employees of the plant transportation department, and some of the economies that were effected.

Mr. Ashman, occupying a similar position to Mr. Fike in the Schenectady works of the General Electric Co., indicated quite a difference in the systems of the two companies. Operation of the cranes and elevators at Schenectady is under separate control from the ground conveyors, although both are under one general supervisor. Internal and external plant movements are conducted separately. Mr. Ashman thought the use of tractors and trailers offered the greatest means of economies among the various kinds of vehicles used in plant transportation. At Schenectady, the plant is laid out in five zones with shuttle service to a central classification station, with each crew making six or seven collections and a like number of deliveries each day. Payment was on a straight day basis.

At East Pittsburgh, the plan is for group payment, with each member of the group, including the director of each group, sharing in pooled pay based upon time and distributed on the basis of the number of hours worked by each. There are penalties for failure to make schedules, damaged goods, etc., but no workman can be penalized more than the bonus accruing during one pay period.

Mr. Ashman thought that Mr. Fike's estimate of $130 per month as the cost of the operation of a truck was low, stating that at Schenectady it ran in labor charges alone to $220, for a two-man crew, and total charges were close to $275 per month. Mr. Fike said in answer that his costs were based upon one-man operation of trucks, and that the industrial trucks were electrically motivated, with very low upkeep and depreciation charges, some trucks having been in service 16 years, while charging of batteries was with current costing 8 mills per kwhr.

Mr. Fike also declared, in answer to a question, that the system did not require a big clerical force, since the use of stubs of routing tags took care of payments and the dispatching was done by the group leaders.

Morehead Medal Committee to Receive Papers on Acetylene

The award of the Morehead medal by the International Acetylene Association for contributions of outstanding merit toward the progress of the acetylene industry is always one of the most important events on the program of the annual fall meeting of the association. The award can be granted for technical papers which promise to be of special value in furthering the use of acetylene for any purpose. Persons who desire to submit papers of this sort should send them to the committee on the Morehead medal, International Acetylene Association, 30 East Forty-second Street, New York, before Aug. 1.

Steel & Tubes, Inc., to Build New Plant

Steel & Tubes, Inc., Cleveland, plans erection of a new plant at Ferndale, Mich., a Detroit suburb, on Grand Trunk Railroad. Negotiations are being closed for a 20-acre site. Plans provide for a building containing 105,000 sq. ft. of floor space and plant will have a capacity for making 3,000,000 ft. of welded steel tubing per month. The estimated cost of the new plant, including the site and equipment, is $700,000.

Safety in the Machine Shop

Greater Care Urged in Inspection of Chains and Cables—Need for Goggles—Education of the Men

BY WILLIAM J. FISHER*

PROGRESS in safety matters in any factory is undoubtedly in proportion to the extent to which the superintendent first, and through him the foremen, are "sold" on the idea. Most of our plants are too small to be able to employ full-time safety engineers, or to maintain a full-time safety organization, whose sole duty is to look after the safety and general welfare of its employees. Due to the lack of such an organization, continually devising new ways and means of keeping the safety idea forward, "Safety, first, last and all the time" presents a problem for the smaller factories.

It has been my observation that, unless methods of presenting safety and of handling safety matters are changed from time to time, proper observance of safe practices cannot be maintained. The small shop is thus dependent to a more or less degree upon the State Department for suggestions as to ways and means of maintaining continued interest in safety matters.

Educating the Employee

The first and most important idea to be instilled into an employee, for the elimination of accidents, is that it is his duty to his family and his home to work safely at all times. The National Safety Council is doing a great work in putting this idea across to the workman. The picture bulletins issued are attractive, are read by the employees and have a good effect.

We are living in an age when there is a continuous demand for something new. The great force back of our prosperity is the putting forth of new things to attract and thereby create a desire and demand, which in turn means more work for our factories and our employees. The ultimate objective of all safety programs is that employees may acquire the safety habit. Picture bulletins, safety meetings and the many other methods used to attract attention to safety matters are means to that end; namely, habit.

Third of importance in elimination of accidents is a common understanding between employees and management of each other's attitude toward safe practices and necessary changes, to make the plant a safe place in which to work.

Mechanical Safeguards

Modern machine tools have solved a large safety problem by having necessary guards and safety devices built into the tool itself. The continued use of old-type machines, however, necessitates the inclosing of open belts, open gears, etc. When this is found necessary I believe the open-type guard to be the most practical. Employees will keep the open-type guard in place more readily than the closed type. I have been unable to assign any reason for this except, perhaps, that men naturally want to see moving parts.

It is the duty of the management to see that mechanical safeguards are thrown around employees. Gears should be guarded, no matter how remote their location. Some of the most serious finger accidents occur in gears in which it was thought impossible for a workman to get caught. Any foreman or manager who argues against covering gears, because they may be quite a distance above a man's head or in a remote place, under or back of a machine, is arguing from lack of experience.

Motor-driven machines have solved the hazard found in the overhead belt. Practically all machine shops, however, continue to use a great many overhead belts. While they present a more or less hazardous condition, it is a difficult situation to cope with. About the only thing which can be done is to put guards under the larger and heavier belts, which, if they should tear, may cause injury to a workman. These guards must be properly designed and supported, or they may create a greater hazard than existed with the open belt. Another precaution is to inspect the belts periodically and remove any that have worn thin, or show signs of weakness.

Chains and Cables Need Care

Another hazard in the machine shop which is difficult to handle is from the chains and cables used on cranes and hoists. Especially is this true in shops where heavy work is handled. Cables should be inspected at regular intervals and, when broken strands are found, should be replaced. Chains present a more difficult problem. They likewise should be inspected periodically and, if stretch has been set up in the links, the chain should be replaced.

Chains used continuously should be annealed at regular intervals. There seems to be great difference of opinion as to how long a chain should be used before annealing, but we believe that they should not be used longer than one year.

Inspection of chains does not reveal defects so readily as in cable. A link may be defective on the inside, or it may have a defect which only the trained eye can detect. A good plan is to send the chains occasionally to the chain manufacturers and have them inspected and tested and a report rendered on the maximum load it is safe to lift with the chain.

These safety precautions are necessary to prevent accidents from breaking chains. An important point in maintaining chain efficiency is instruction to the workmen in the proper way to apply and hook up a chain to a load. Nothing contributes so much toward rendering a good chain useless as allowing a sharp edge of a heavy load to come against a link in somewhat of a shearing position. If this is done a chain may carry the load at the time and at some future time break on a light load.

Keeping Adequate Aisles Open

Another matter of importance is that of fixed and open gangways. Nothing is so conducive to good housekeeping and prevents more foot accidents than well-kept gangways. If trouble is experienced in keeping gangways open, I know of no better method than to paint lines where the aisle is to be. The painted line in itself establishes definiteness of purpose and location. While it may be necessary to replace the line

*Superintendent A. B. Farquhar Co., York, Pa. This is abstract of a paper presented before the Pennsylvania State Safety Congress, in Philadelphia.

two or three times, after a while the employees get the habit of maintaining a gangway and the painted line is no longer necessary.

Another important factor in accident prevention is the maintaining of morale through adequate and good tools with which to work. When a workman is disgusted or discouraged, due to poor or insufficient tools, he is most liable to have an accident. In this mood, his mind is not directed to safe ways of working, but is rather concentrated on the thing which causes the discouragement.

Fatigue likewise causes accidents which would not otherwise occur. Discouragement and disgust bring on fatigue, while keeping the workman in the proper frame of mind maintains his poise and happiness—and fatigue is not brought on nearly so soon.

The items I have enumerated are some of the things which lie wholly within the power of management to do to prevent accidents. All accident prevention does not rest with the foreman or the workman. It starts with those of us who have to do with management, and we carry a definite responsibility toward creating a spirit of safety, first, last and all the time.

Elimination of Eye Hazards

Goggles provided by practically all shops are for the men to wear to prevent eye accidents. It seems to be difficult, however, to get employees to wear them. After years of patience and insistence and improvement in goggles, we have succeeded in getting the employees who do chipping to wear them rather willingly. On other operations you will invariably find the goggles in the tool box or some other place of storage. Even in grinding operations the foremen must continue to insist that they be worn, as men have not reached the place where they feel it is entirely necessary.

One problem of the machine shop is to determine in which operations goggles must be worn. All agree they should be worn in the pouring of metal, chipping, grinding and similar operations, where the hazard of flying particles is the result of the operation. But what about the lathe, drill press and some of the other machine tool operations?

One of the most serious eye accidents which ever came to my notice was when a lathe operator had trouble truing up a job in the lathe chuck. In a fit of impatience he attempted to hit it a severe blow and, instead, hit the corner of the chuck jaw. A steel chip flew into his eye, which later caused the removal of the eye. This was an unusual accident, but it is not unusual to see flying chips in lathe operations, and especially in the turning of non-ferrous metals.

Screens and many types of contrivances have been suggested, designed and used. But almost all of them are inconvenient and to most mechanics are impractical. The only safeguard against this hazard is the wearing of goggles. Practically all machine shop employees are more or less subject to eye hazards, but goggles have not reached such a stage of personal comfort that we are willing to insist upon their general use. It seems, therefore, that up to this time we have been content to see that they are worn on those operations which present glaring eye hazards. For the rest, we insist that the men go to the first aid room, rather than to a fellow employee, to have particles removed from the eyes.

It is a continuous up-hill job to get men who are compelled to wear glasses to remove them and wear goggles. For these men we are seriously in need of goggles which can be used over their own glasses, and they do not seem to be available. And to remove glasses and put on goggles creates a hazard through improper vision.

Other Causes of Accident

Then we have the hazard of the accumulation of slivers on the heads of chisels, wedges, etc. The prevention of accident from this source likewise belongs to the individual employee. But the foreman has the responsibility of instructing the employee not to use tools with improper heads.

With overhead traveling cranes we have the hazard of workmen walking under, or failing to get away from under, overhead loads. This likewise is an employee's personal responsibility, provided, of course, a warning bell is used on the crane.

Many other instances could be cited where the employees' personal responsibility is a factor in accident prevention. Our human frailties are the greatest contributors to accidents, and the greatest of these is thoughtlessness. Safety codes are a great help, as they are text books through which certain hazards are called to our attention and the methods for remedying them are suggested and established. All these mediums are important and necessary, but it seems to me our future progress is centered around "education."

As the children of today will be our people in industry tomorrow, safety education should begin with childhood. Definite programs in our public school system, which would establish indelible safety impressions, would be a great help toward creating the safety habit and eventually have its effect upon safety in industry.

Responsibility of Foremen

A great deal has been said concerning the responsibility of the foreman toward accident prevention. Some leaders have indicted the foremen as lacking the proper interest in safety matters. I question whether this criticism is just, when viewed from the broader aspect of the subject.

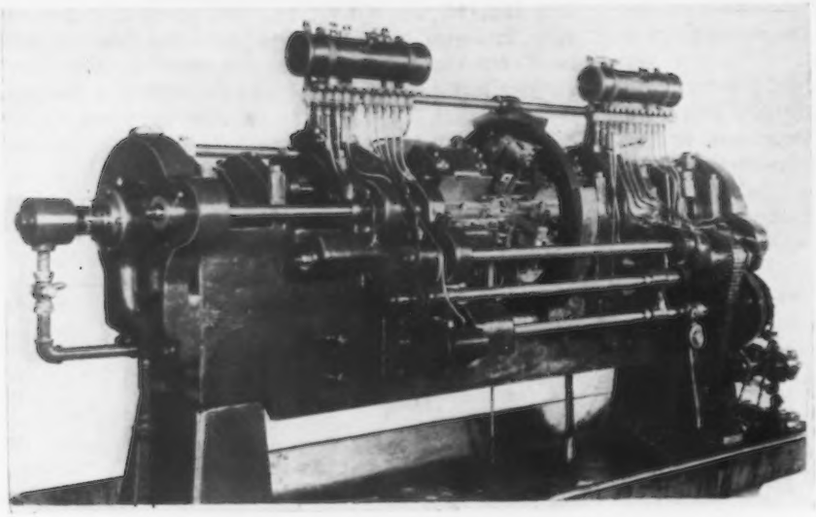
The first duty of the foreman, and rightly so, is to maintain production schedules. But I believe he realizes to its fullest extent that, to do so, he must have a steady and trained working force. He further realizes that it is to his best interest to prevent accidents which cause loss of time and serious interference in the results he desires to obtain.

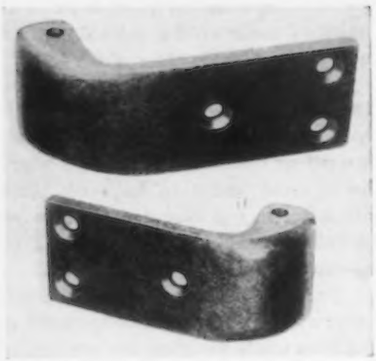
Shipyard Conducts Intensive Safety Campaign

Comprehensive preparations have been made to make June a "no accident month" at the plant of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. A series of meetings has been held and extensive use has been made of posters, placards and bulletins to awaken interest in the drive.

A unique flag arrangement will be used to advertise the status of each department in lost-time accidents during the month. This consists of a safety flag which will be flown by each department every day, until a lost-time accident occurs, when the safety flag will be replaced by a black flag as a mark of demerit. Score boards will show the daily rating of all departments. Penalties will be based upon accidents that necessitate sending the injured employee home, with the result that he is unable to report for work again on his next regular shift, but penalties will not be imposed for minor injuries.

The campaign includes prize contests for the best slogan placards dealing with safety, and using letters that spell the name of the employee's own department to start the line. A silver medal will also be awarded to the employee, below the rank of supervisor, who is considered to have done most to promote safety during the month of June.





The Operator Merely Places the Hinges in the Fixture, the Work Being Located and Clamped Automatically

Hinges Drilled and Countersunk at Rate of 1200 Per Hour

The drilling and countersinking of three holes in an automobile door hinge is accomplished on a high production basis on the machine illustrated, the output being given as 1200 hinges per hour. The machine is the "non-stop" automatic drill of the Davenport Machine Tool Co., Inc., Rochester, N. Y., arranged to permit the use of five sets of work-holding fixtures and drilling heads, which revolve continuously while the cutting and clamping operations are being performed. The operator merely places the work in the fixtures and, as the fixture unit revolves, the work is automatically located and clamped.

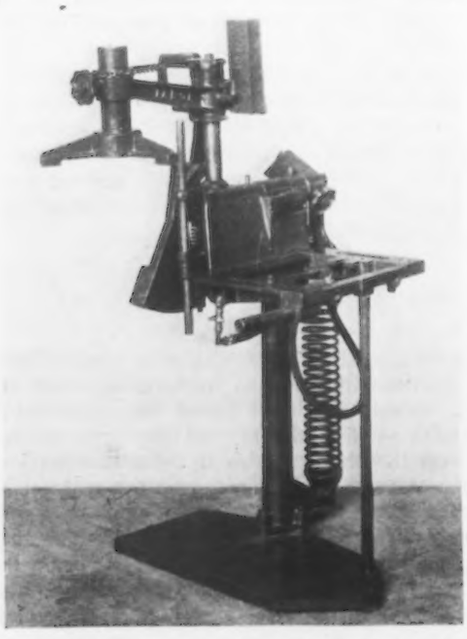
Three spindles in a cluster box on the left-hand end of the machine drill and countersink the holes simultaneously, after which they are withdrawn and three more spindles on the right-hand end approach and countersink the other side of the hinge. The clamping device is then released automatically and the work is dropped into the pan, leaving the fixture open ready to receive a new piece of work.

Although the center distance of the spindles is close, the gears that drive the spindles are of good size. Both the gears and spindles are hardened. The drill spindles are fed by cams located at each end of the machine. Ample cutting compound is supplied to the tools by a geared pump.

The production, quoted at 1200 per hour, is said to be limited only by the ability of the operator to place the work into the fixture during one-fifth of the time required to revolve the fixture holder. Although the fixtures, etc., employed make the machine a single purpose unit, it is stated that the basic principle permits a variety of work to be machined.

Core Machine Eliminates Unnecessary Moves by Operator

Elimination of unnecessary moves on the part of the operator is a feature of a core machine built by the Tabor Mfg. Co., Philadelphia. A core box is filled and the core plate placed in position in the usual manner. The clamping head is then swung into position over the core box and the draw lever, shown at the back of the picture, is pulled down one-half turn. This clamps and automatically levels in one move. The machine is then rolled over and the same draw lever reversed one-half revolution, which unclamps, draws the core and swings it out to a convenient position for the operator to carry away. This dispenses with the need for walking around the machine and any operations of handling independent clamps. In general clamping and unclamping leveling devices are eliminated.

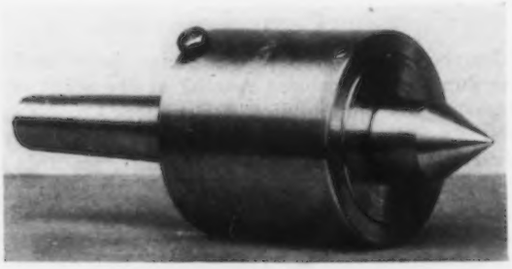


The Machine Is for Core Boxes Up to 14 In. Wide, 24 In. Long, 7 In. Deep, With 4-In. Draw

Anti-Friction Center for Heavy Loads

An anti-friction center, designated as the Supercenter and available in load carrying capacities up to 3 tons, has been added to the line of the Snellex Mfg. Co., Rochester, N. Y.

Features of the device, which is illustrated herewith, include automatic takeup of the expansion of the work by means of a hardened steel cushion. Lubrication is not required at the center point because two tapered roller bearings eliminate the wear between the point and the work. Wear of the roller bearings is taken up automatically. A strainer at the bottom of the oil hole serves to remove solids from the oil. Shanks can be made to any taper and any type of center point, for turning car axles, crankshafts, gears and other work, can be furnished.

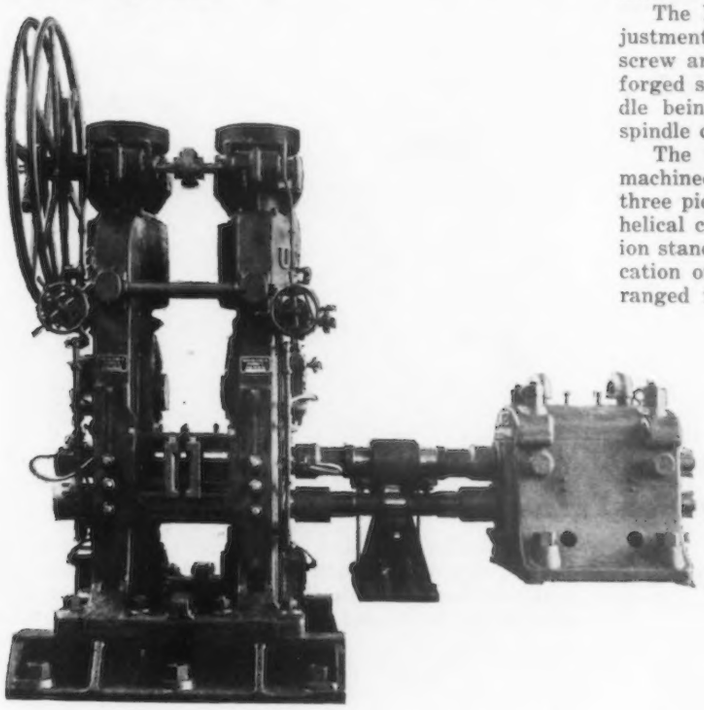


Roller Bearings Eliminate Wear Between the Center Point and the Work

TWO-HIGH HOT STRIP MILL

Large Roller Bearings Resemble Backing-Up Rolls—Better Production

SOMETHING different in hot strip mills has been developed by the United Engineering & Foundry Co., Pittsburgh. It is a two-high mill, which looks like a four-high mill because the roll necks are practically a continuation of the body and run on the large roller bearings, which give the appearance of backing-up rolls, as in four-high mills.



Large Roller Bearings in Each Half of the Housing, Above and Below the Rolls, Give the Appearance of Backing-Up Rolls. Fine screwdown adjustment, for rolling hot strip steel within narrow limits, is another feature

Side thrust is taken care of also by roller bearings. These side roller bearings are pivoted from the housings of the large roller bearings and are adjusted against the roll neck by large bolts, the heads and locknuts of which may be seen on the edge of the mill housings. The mill rolls are thrust against the large roller bearings by hardwood wedges, which are fed in between them by large center adjusting bolts, also showing on the edge of the housings.

Equipping the mill throughout with adequate roller bearings materially reduces power consumption, while maintenance of gage is made easier. Upkeep is reduced, as roller bearings do not wear appreciably, and production is speeded up. The mill is a 10½-in. by 18-in. hot strip mill and is guaranteed to roll 4 in. wide by 0.035 in. thick, hot, high-carbon steel with a variation from center to edge of not over 0.0005 in. in thickness.

The hand-operated screwdown is built for fine adjustment, has a separate handwheel for each housing screw and has drum-type indicators. The spindles are forged steel with machined wabbler ends, the top spindle being of the Flynn patented friction type. The spindle carriers are of the spoon type, spring balanced.

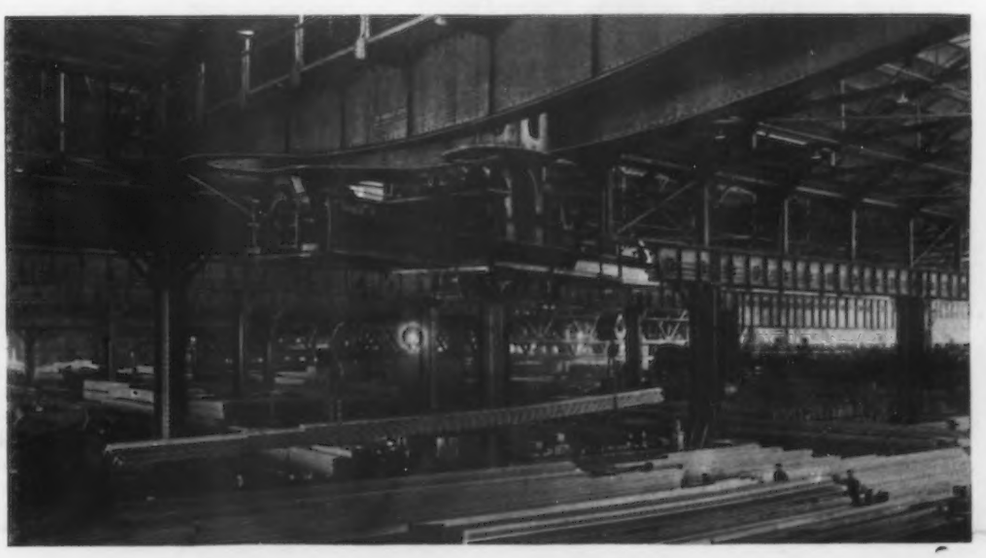
The pinion housing is a one-piece casting with machined windows and cast iron babbitted bearings in three pieces. The pinions are forged steel, with double helical cut teeth and machined wabbler ends. The pinion stand is fitted with oil baffles to insure proper lubrication of the pinion teeth, while the bearings are arranged for either oil or grease lubrication.

The roll stand is equipped with a large grease gun on each housing, with leads to all bearings, flexible hose being used for all parts which have not a fixed location. The mill is fitted also with adjustable entering and delivery guides, and altogether makes a compact and complete unit.

Swiveling Crane of Unusual Type

To accommodate mill shipping conditions in the new structural mills of the Carnegie Steel Co. at the Homestead works, Munhall, Pa., three 20-ton overhead traveling cranes of unique design are in use. Each crane has a rotating arm or beam with a 10-ton hoist at each end. The beam is swiveled from a turntable on the trolley and is under easy control of the operator. It is rotated with the full 20-ton load, and either end may be used to its capacity of 10 tons, without any load at the other end, and without upsetting the equilibrium of the beam. This quality is important where a load is to be picked up in a bay adjacent to that in which the crane operates.

Steel from both the 36-in. structural mill and the 52-in. mill rolling the new Carnegie beams approaches the shipping bay on a line running east and west. The



Swiveling Crane in the Shipping Yard, Serving Both the Standard Beam Mill and the H-Beam Mill. There are three of these cranes, each of 20 tons, having a 10-ton hoist at each end of the swiveling beam

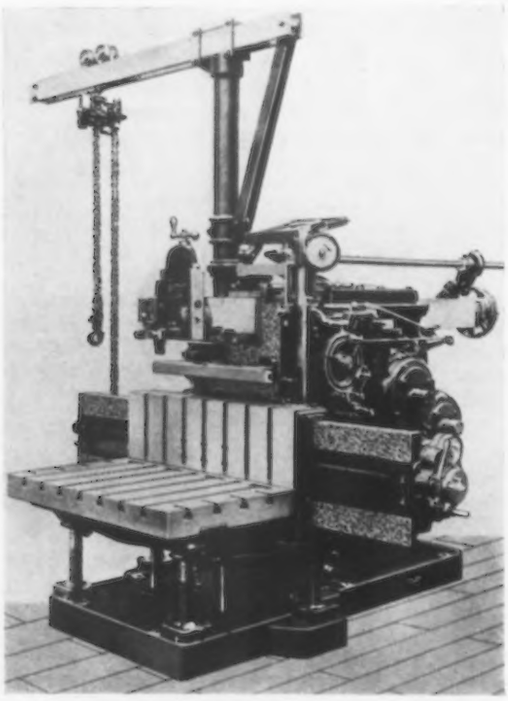
car tracks in the shipping bay, however, because of space conditions and other limitations, are on a line running north and south. Consequently, all beams have to be turned through an angle of 90 deg. for loading. That is the reason for the swiveled arrangement on the cranes in that bay.

Some of the steel shipped from that location goes out in the new 65-ft. gondola cars which were described briefly in THE IRON AGE of April 19, page 1090. These are used primarily to avoid the expensive blocking required in shipping long lengths of steel on two adjacent cars. A general description of the new Carnegie beam mill was carried in THE IRON AGE of May 17, page 1380.

Draw-Cut Planer for Railroad Work

For machining the frame fits in guide yoke tie braces and cross tie braces, the Morton Mfg. Co., Muskegon Heights, Mich., has brought out the high-duty draw-cut planer here illustrated. In addition to the special purposes for which it was designed, the planer is offered also for the machining of the guide fits on back cylinder head blocks, locomotive deck castings, the casting units between cylinders and other railroad work.

The machine has a cutting stroke of 38 in., horizontal or side feed of 60 in., and vertical feed of 21 in. Rapid traverse, both horizontal and vertical, are provided and all feeds are automatic and may be changed while the machine is in operation. The machine is of



Draw-Cut Planer for Machining Frame Fits in Guide Yoke Tie Braces, and Other Work

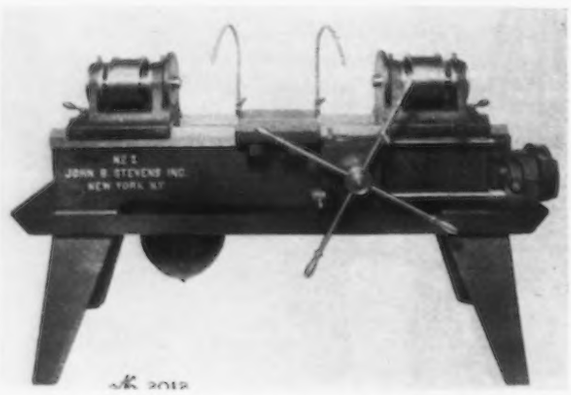
the four-screw type which permits convenient handling of large and bulky castings. It has a rotating arbor for slotting and finishing driving boxes and will accommodate all of the company's special attachments for railroad work.

To Exhibit Steel Mill Novelties

The Westinghouse Electric & Mfg. Co. exhibit, at the exposition in connection with the annual convention of the Association of Iron and Steel Electrical Engineers, will feature a new definite time-limit steel mill controller to be operated in connection with a type MC mill motor. An animated, electrically lighted diagram will show graphically the operation of the contactors and the motion of the armature during acceleration and plugging. Another feature will be an electrically motivated roll table, which will be operated and reversed automatically by having the billet interrupt the passage of a ray of light to a photo-electric cell.

Double-End Drill with Ball-Bearing Mounting of Spindles and Shafts

Ball bearing mounting of the spindles and other revolving parts is a feature of a No. 2 Duple horizontal drilling machine, for drilling, boring, beveling, chamfering, reaming, facing and for some classes of threading and tapping, which has been placed on the market by John B. Stevens, Inc., 27 Cleveland Place, New York. Maintenance of original accuracy of alinement, ease of operation and added power, due to the use of ball bearings, are claimed for the machine.



Construction of the Bed, Heads and Other Units Is Intended to Provide Lasting Accuracy of Alinement

The bed is deep and massive, has four wide cross braces, and Vees are of large proportions to assure maintenance of spindle alinement. The heads are also of massive design and are gibbed to the bed-Vees with adjustable taper gibs. The spindles revolve in ball bearings which take both radial and thrust loads. Cross slots engage the tangs of drills, which may be ejected by means of a knock-out rod.

Each head is fed by means of a 1½-in. diameter square-thread screw, the screw being mounted in ball bearings beneath the heads. A cross-shaft, also provided with radial and thrust ball bearings, carries a helical bevel gear, which meshes with two helical bevels, one on each of the head driving screws. The front end of the cross-shaft carries a bronze worm gear which is driven by a hardened steel worm on the worm shaft. The latter, which extends to the right as shown in the illustration, is through gears by means of a belt drive from the right-hand countershaft. Four change gears are furnished to permit three different feed changes. A safety shear pin is provided, as well as hand and automatic trips for the feed and a positive stop. Two countershafts, one for each head, are furnished.

Plain or back-geared heads may be provided on the machine. The swing over the Vees is 14 in. and the distance between spindles is 36 in., maximum, and 10⅜ in., minimum. The drilling capacity of the plain head machine in cast iron is 1⅛ in. and in steel, ⅞ in., the capacity of the back-geared head unit being 1½ in. in cast iron and 1⅛ in. in steel. Feeds of 0.003, 0.0065 and 0.014 in. per revolution of the spindle are obtainable on the plain head drill, and 0.0045, 0.0105 and 0.014 in. on the back-geared head machine. The floor space occupied is 24 by 80 in. The weight of the back-geared head unit is 2600 lb.

Electrically Welded Chain for Hoist

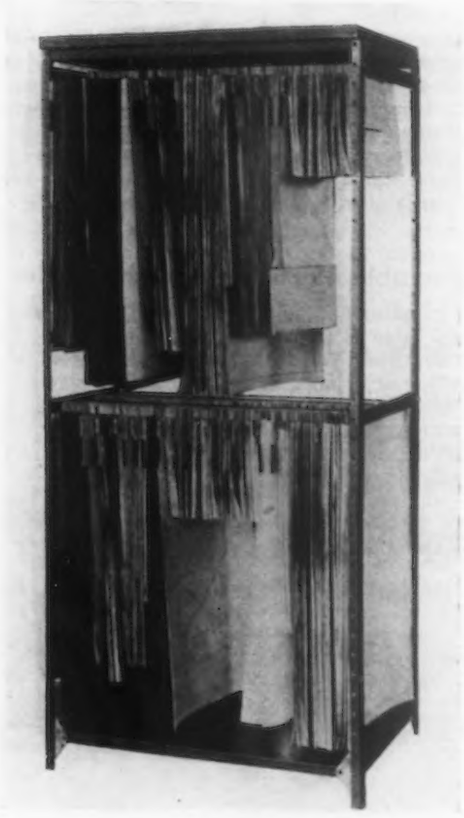
Great strength and great ability to withstand wear are demanded of the chain in a chain hoist. It must not stretch under heavy loads. A high-carbon, electrically welded chain is now being made for the Tribloc hoist of the Ford Chain Block Co., Second and Diamond Streets, Philadelphia. Every link is proof tested. When the chain is assembled it is again tested and must show an overload of 50 per cent above its rated capacity. Hoists are built in capacities from ¼ ton to 20 tons.

RACKS FOR SHOP RECORDS

Folds, Wrinkles and Other Damage Eliminated in Loose Leaf System

BETTER preservation of drawings, maps, records, etc., has been obtained by hanging up or suspending such sheets in specially constructed racks which have been developed by the Globe-Wernicke Co., Cincinnati. Adoption of this system has reduced sheet friction to a minimum, has eliminated unequal and extending edges and has made folds and wrinkles much less frequent and less detrimental. One system was inspected recently which had been in daily use for over 40 years. The sheets were exceptionally well preserved and the only replacement was due to thumbing the corners.

The usual method of suspension is accomplished by consolidating sheets between binders so as to form a book which is hung from a rack, mechanism being employed that permits the removal of any book. Binders, however, have not been found entirely satisfactory be-



Ready Accessibility of the Filed Drawings Is Shown in This Illustration

cause of the labor in gaining access to individual sheets which must necessarily be thumbed in the process.

Binders and all such accessory equipment are eliminated by the application of a loose leaf clip to the individual sheets, the clips being attached to the sheets by adhesion. The clips are snapped over horizontal rods, as shown in the accompanying illustration, and are thicker than the sheets so that there is an air space between adjacent sheets. Dust does not adhere readily to the vertical sheets and there is no sheet friction to rub into the sheets the dust that may have accumulated when the sheet was out of the file. A feature of the system is the fact that the entire surface of every sheet can be exposed for reference without removal from the file.

Suspended individual sheet filing lends itself to the application of a time-saving index. A numerical index is made possible by suspending guide cards by means of two loose leaf clips. A guide with green angle tabs is hung every 100 sheets and guides with yellow angle tabs mark the 25, 50 and 75 subdivisions. The visibility of the colored guides leads the seeker directly to the group of 25 drawings in which the desired sheet is located. If the consecutive drawing numbers are placed in the location, the sheet may be "flared" and a series of numbers exposed for the quick selection of any sheet. When drawings are removed from the files, cards bearing the word "out" can be used to replace the drawings.

Improved Combination Bevel

Unobstructed view of any angle at which the blades may be set, because of the height of the two posts, is a feature of an improved combination bevel for tool and pattern makers, which has been placed on the market by the Brown & Sharpe Mfg. Co., Providence. The posts give clearance for scribing or drawing lines the

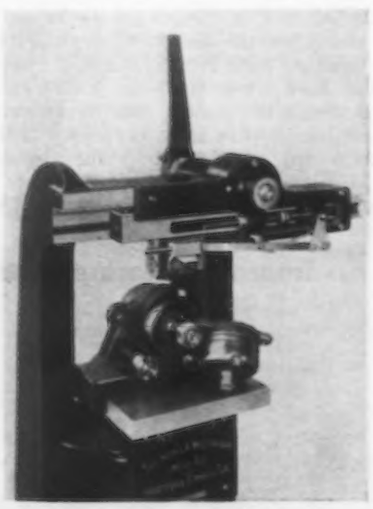
The Angle at Which the Blades Are Set May Be Seen Conveniently

full length of the blades and also make possible the use of the blades on alternate sides of a projection up to ⅞ in. high.

The back of the tool is flat and the tool can be laid directly on the work. The clamp nuts are designed so that the blades may be moved freely without looseness, or locked securely by tightening the clamp nuts. The blades, ground on all sides, are of steel, and the ends are ground accurately to angles of 30, 45, 60 and 90 deg. To decrease the weight of the tool the posts are made of a light metal. The tool is designated as the No. 502.

Numbers Parts with Curved Surfaces

Marking equipment developed by the Noble & Westbrook Mfg. Co., East Hartford, Conn., for the serial numbering of pieces having curved surfaces is shown in the accompanying illustration. The equipment consists of one of the company's standard hand-operated



A Special Work-Head and Work-Holder Are Used. Change of numbers is by an automatic tripping device

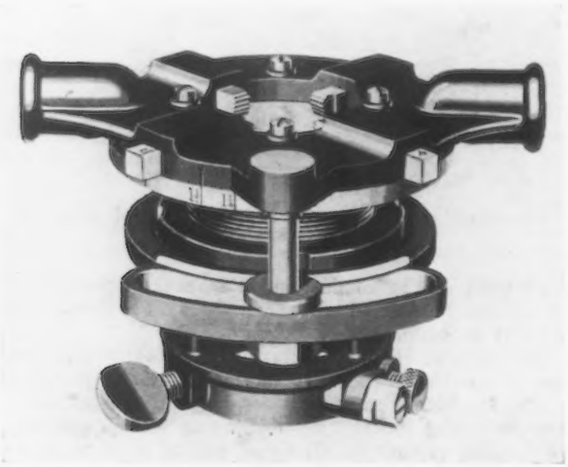
marking machines equipped with a special work-head and work-holder. The machine illustrated is being employed in marking hydraulic shock absorber parts.

The numbering head is fitted with a special shank to adapt it for use in the marking machine, and an automatic tripping device attached to this head serves to change the numbering device to the next highest number after a mark is made. The marking of the serial number is accomplished by the forward stroke of the numbering head over the part to be marked, this part revolving on its own center on roller bearings. The wheels in the numbering head may also be operated independently by disengaging the tripping device, in case duplicate numbering is required.

Self-Contained and Adjustable Die Stocks

The Borden Co., Warren, Ohio, is bringing out two new self-contained and adjustable 1 to 2-in, die stocks, designated as the No. 11 Beaver plain tool and No. 11A Beaver ratchet tool, respectively. The former supersedes the previous No. 25 Beaver plain tool; and No. 11A supersedes the No. 26 ratchet tool. Although of as durable construction, the new die stocks are lighter in weight than the previous models and are easier working and of simpler design.

One set of dies can be rapidly set to thread 1, 1¼, 1½ or 2-in., and, being in the tool, ready for use, the dies cannot become lost or mislaid. Dies are quickly adjusted to thread under or over standard sizes, without affecting the length of the thread. Special dies are not required for threading brass pipe.



One Set of Dies Can Be Set Quickly to Cut 1, 1¼, 1½ or 2-In. Threads

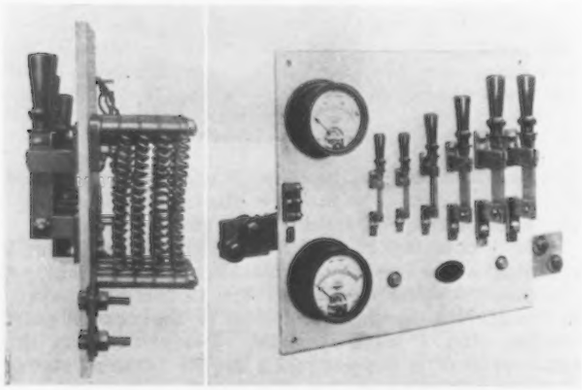
The threading dies in the new tools are of alloy steel, and are heat treated. The die-head and threaded barrel of the tool are separate parts. The work-holder or pipe-gripping device is of new design and is said to center the pipe with unusual accuracy. Two knurled screws, which serve to hold firmly to pipe size, can be set quickly, leaving only the thumb screw to be tightened after the die stock is placed on the pipe. Loose bushings have been eliminated. After the work-holder has been set to size only a straight thread can be cut, although the holder may be adjusted conveniently for cutting crooked or drip threads if desired. It will also grip any size coupling for threading short nipples. All parts of the die stock are made on the interchangeable basis, facilitating renewals of parts.

Improved Plating Tank Rheostat

An improved type of plating tank rheostat, named the "Optimus," has been placed on the market by the Hanson-Van Winkle-Munning Co., Matawan, N. J. The rheostat is intended to facilitate the regulation of plating baths, and simplify the operation of chromium, nickel, copper, brass, cadmium, zinc, tin and other plating solutions.

The construction is according to power apparatus standards. Mounting of the resistance coils on studs back of the panel board is intended to provide better ventilation, increase the overload capacity and eliminate loosening of coils. Standard knife switches are employed. The type REI rheostat is equipped with voltmeter and ammeter mounted on the rheostat panel, and the instruments and shunt are said to be arranged to prevent distortion of meter readings. The voltmeter permits the plater to read, not only the line voltage, but also the voltage drop from anode to cathode directly at the tank, the latter reading being of importance in determining the conductivity of the solution. The ammeter provides visual indication of the total current passing through the solution, so that with a known cathode surface exposed the current density may be calculated readily. With this calculation made, the amount of deposit in a given time is easily and definitely determined.

Electrical ratings of the Optimus rheostats have been developed around the standard electrical ratings of single-pole knife switches, and the resistance steps controlled by the knife switches are designed so that in normal service neither the resistance step itself nor the knife switch carries more than its rated capacity. These tank rheostats are mounted on asbestos panel boards of sturdy construction.



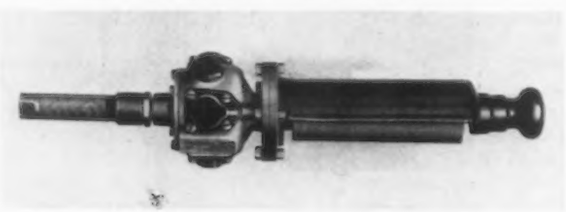
Mounting of the Plating-Tank Rheostat Resistance Coils on Studs Back of the Panel Board Is Intended to Provide Better Ventilation and Eliminate Loosening of the Coils

Portable Pneumatic Rod Grinder

For grinding and polishing locomotive side and main rods and valve motion rods, the Ingersoll-Rand Co., 11 Broadway, New York, has made available a portable pneumatic rod grinder designated as the size 63. The tool is designed to use a 6-in, grinding wheel and is provided with an outboard bearing and hand grip.

Other applications in the railroad shop include grinding welds on side rods, grinding brasses to fit main rods, grinding jaws in main rods to smooth them up for new brasses, grinding frame jaws for reseating wedges and grinding holes in frames for refitting brake pins.

In general design, the machine is similar to the other grinders manufactured by the company. The motor has three cylinders spaced about the center line of the spindle, all delivering power to one crankpin. This arrangement, together with a counterweighted crank, is intended to minimize vibration and assure a steady torque at the spindle. Each of the three cast-iron cylinders is separate from the aluminum case. The cylinders are interchangeable and may be removed readily for replacement.



Although Designed for Use on Locomotive Side Rods and Brasses, the Tool Is Adapted for Any Wide Surface That Is to Have Smooth Finish

The valve, crank and spindle are of one piece and the crank spindle is supported by three sets of ball bearings. The grinding wheels employed are 2½ in. in diameter and the average free speed is 6000 r.p.m. The length overall is 23¼ in. and the weight of the machine is 23¼ lb.

Dealer-manufacturer relations, standardization of price sheet sizes, and the appraisal system of handling the used tool problem were discussed by 34 members of the Associated Machine Tool Dealers at a three-day meeting held May 23, 24 and 25 at Granville, Ohio.

NEW FINISHING MILLER

Bearing Surface, Fillets and Ends of Car Journal Bearings Machined in One Operation

FOR finishing the bearing surface, fillets and ends of car journal bearings in one operation, after being babbitt lined, the Morton Mfg. Co., Muskegon Heights, Mich., is offering the new finishing miller here illustrated.

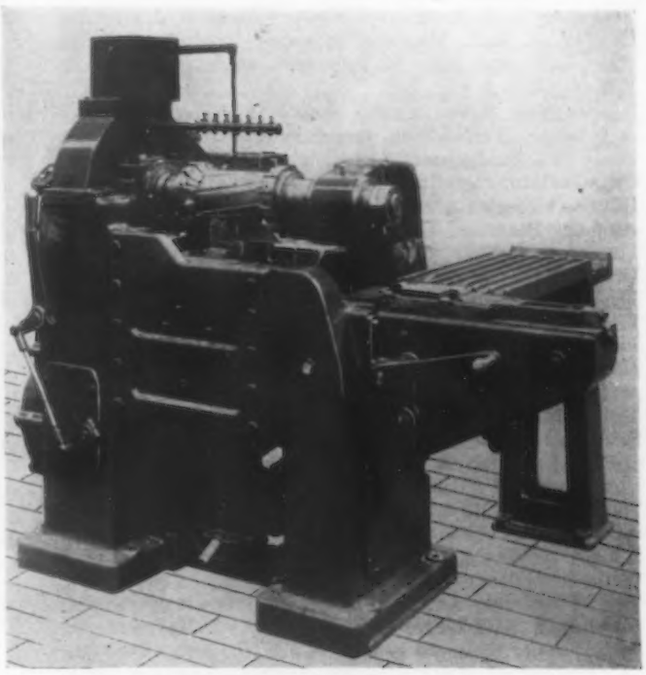
The column, of box construction, is designed with fixed center distance for the shaft and gear journal bearings in order to assure alinement at all times. The chuck for holding the brasses has rotating jaws, which open and close automatically as the chuck is raised and lowered to and from the cutter. It is fitted to a trunnion bearing between the columns and the side plates. The chuck is raised and lowered by a quill which is threaded at its lower end and is provided with locknuts for raising and lowering the connecting members for the purpose of adjustment when setting bearings of different sizes. The steel jaws furnished for various sizes of bearings may be mounted and removed conveniently. The locknuts on the quill have eight slots for the spanner wrench and when making vertical adjustment the movement from the center of one slot to another is 1/64 in.

Power for raising and lowering the chuck to and from the cutter is applied through levers and adjustable connections and through a shaft. The cam employed for raising the work to the cutter is designed so that the work moves up quickly until it comes in contact with the cutter, when it feeds the cutter in the normal manner. At the finish of the cutting operation the chuck lowers rapidly, automatically releasing the jaws and leaving the work free to be removed. Power is transmitted to the cam from the arbor through gears.

The eccentric adjustment applied to the trunnion provides means for raising the work for a second cut, when required. The controlling quadrant has three notches, each giving 0.026 in. adjustment. When because of shrinkage the bearing does not clean out perfectly in the first cut, the lever may be adjusted a notch as the chuck returns to its down position, and a second cut made without removing the work. The lever may be adjusted for third and fourth cuts where necessary.

The main driving arbor is hollow and has adjustable bronze bearings. The cutter arbor is fitted and feather keyed, permitting adjustment sidewise for alining with the work. The arbor and shafts are ground true where required. Bearings are bronze bushed and those in the main column are oiled automatically. Gears are cut from the solid and both gears and pinions are inclosed and run in oil. Lubrication of the cutter is by a gravity system.

A bearing loading column attached to the right-hand column of the machine enables the operator to place the work on the outside, eliminating any chance of injury from the cutter. The arbor journal bearing is secured to the side extension of the column, as shown, which arrangement provides a clear opening for loading and unloading the work. The bearing is on a sliding plate, and by moving a lever provided for the purpose, to left, it is set in operating position and centered with the cutter. After the cutting cycle has been completed, the lever is moved to the right and the bearing positioned for unloading.



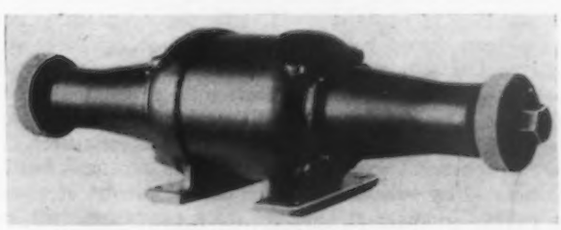
The Loading Carriage on the Right-Hand Column Eliminates Danger to the Operator From the Cutters. With the chipping and inspection bench, only one lifting of the bearing is necessary during the entire finishing process

A chipping and inspection bench with interchangeable V-blocks for bearings of various sizes can be attached to the loading bracket, the arrangement being as shown in the illustration. The machine may be driven by constant-speed motor with starting and stopping controlled by a push button. The motor is mounted on a bracket at the rear of the machine.

High-Frequency Electric Grinders

A series of high-frequency electric grinders for speeds of 5400 to 10,800 r.p.m., and designed to use wheels ranging from 1 to 5 in. in diameter, has been added to the line of Forbes & Myers, Worcester, Mass.

One of the machines, the No. 204, a 5400-r.p.m. double-end unit with ¾-hp. motor, for operation on 180-cycle current, and designed to carry 3 to 4-in. wheels, is shown herewith. The spindle is ¾ in. in diameter at the wheels and is 23 in. long. Four ball bearings are used, with a large reservoir for grease between the two bearings in each arm. The wheel flanges are 2 in. in diameter. The motor is of the squirrel-cage induction type, fully inclosed and, except for the necessary changes in winding, is exactly like the usual induction motor for 1800 and 3600 r.p.m.



A ¾-Hp. Motor for Operation on 180-Cycle Current Is Employed. Wheels 3 to 4 in. in diameter may be used

Grinders of similar design but with the arm on one end only, or without the supporting arms, are also being offered. In the higher speeds the machines can be furnished with a threaded hole in the end of the spindle for attaching the grinding wheel. They are available in sizes from ¼ to 2 hp., for any high-frequency current.

An advantage emphasized in connection with the use of high frequency motors is that suitable speeds are secured without the use of belts or gears. The wheels are mounted directly on the motor spindle.

Bituminous coal mined in the United States in the week ended May 26 is estimated by the National Coal Association at about 8,300,000 net tons. This compares with 8,183,000 tons reported by the Bureau of Mines for the preceding week and 8,392,000 tons for the week ended May 12.

Montreal, New Haven and Cleveland Steel Treaters Name Officers

At the annual meeting of the Montreal chapter of the American Society for Steel Treating, held on May 19, Robert Job, vice-president Milton Hersey Co., was elected chairman; Fred H. Williams, assistant test engineer Canadian National Railways, vice-chairman; Gordon Sproule, assistant professor at McGill University, treasurer, and Duncan G. MacInnes, associate editor *Engineering Times*, secretary. The following were made members of the executive committee: Robert J. Noakes, superintendent Canadian Pneumatic Tool Co.; T. C. McConkey, vice-president B. J. Coghlin Co.; W. J. Hall, Montreal manager Production Materials, Ltd., and John K. Schofield, secretary-treasurer Edgar Allen & Co., Ltd.

The New Haven, Conn., chapter has elected officers as follows: Harold Fish, secretary and treasurer Ready Tool Co., Bridgeport, Conn., chairman; Thomas H. Chamberlain, metallurgist New Haven Clock Co., New Haven, vice-chairman; Fred E. Stockwell, lubricating engineer Standard Oil Co. of New York, New Haven, secretary, and Walter G. Aurand, metallurgist R. Wallace & Sons Mfg. Co., Wallingford, Conn., treasurer. The new executive committee is made up of Benjamin T. Baker, superintendent of heat treating, Bellis Heat Treating Co., Branford, Conn.; Robert L. Baldwin, metallurgist American Tube & Stamping Co., Bridgeport; Julius E. Brooks, foreman heat treating, Sargent & Co., New Haven; Percy L. Clark, master mechanic Bridgeport Brass Co., Bridgeport; Fred J. Dawless, district sales manager Crucible Steel Co. of America, New Haven; W. Paul Eddy, Jr., metallurgist Geometric Tool Co., New Haven; Rolland G. Hall, assistant superintendent R. Wallace & Sons Mfg. Co., Wallingford; James T. Kemp, metallurgist American Brass Co., Waterbury; Henry G. Keshian, metallurgist Chase Cos., Inc., Waterbury; Arthur Phillips, assistant professor of metallurgy Yale University, New Haven; Raymond T. Porter, superintendent heat treating Heppenstall Forge Co., Bridgeport; Carl J. Sauer, general manager Heppenstall Forge Co.; and Russell S. Young, metallurgist O. K. Tool Co., Shelton. W. Paul Eddy, Jr., has been made delegate to the national nominating committee; Walter G. Aurand, alternate.

The Cleveland chapter has elected D. M. Gurney, metallurgist Warner & Swasey Co., chairman; W. H. White, manager Cleveland branch, Atlas Steel Corporation, vice-chairman, and J. S. Ayling, sales manager Case Hardening Service Co., secretary-treasurer. W. E. Benninghoff, Cleveland Electric Illuminating Co.; W. T. Donkin, metallurgist Cleveland Wire Spring Co.; A. Jenkin, Case School of Applied Science; E. M. Slaughter, metallurgist National Acme Co., and H. H. Smith, superintendent of open-hearth for the Bourne-Fuller Co., have been named members of the executive committee.

Slight Reduction in Steel Works Employment

Employees in 196 iron and steel establishments in April numbered 264,386, compared with 264,526 in the same establishments in March, according to a report of the United States Bureau of Labor Statistics. The reduction is less than 0.1 per cent. There was a reduction of 2.4 per cent in the weekly payroll, which fell from $8,444,983 to $8,239,876.

An increase is reported both in employment and in wages in 990 establishments listed as foundries and machine shops. Employees went up from 229,425 to 231,801, or 1 per cent, while the payroll per week advanced 0.4 per cent, from $6,919,257 to $6,948,964. Machine tool plants, numbering 150, showed a gain of 2.7 per cent in employees and 3.3 per cent in payroll. Employees advanced from 28,835 to 29,609 and one week's payroll from $939,173 to $970,290.

For the entire number of establishments reporting in all industries, there was a reduction in employment from 3,019,966 to 3,005,964 in 10,788 establishments. The weekly payroll declined from $82,463,420 to $81,116,831.

Foundry Research Fund Established in Wisconsin

A fund of $15,000 for research in foundry metallurgy has been established by a group of Wisconsin foundries for the use of the college of engineering of the University of Wisconsin at Madison, and the board of regents has signified its acceptance. The foundries participating are: Falk Corporation, Bucyrus-Erie Co., Harnischfeger Corporation, Sivyer Steel Casting Co., Wehr Steel Co., National Brake & Electric Co., George H. Smith Steel Casting Co., and Milwaukee Steel Foundry Co., all of Milwaukee; and the Racine Steel Castings Co., Racine, Wis.

The research committee of the group, of which Harold S. Falk, vice-president and works manager Falk Corporation, is chairman, made the offer. Under its terms, the manufacturers will contribute $5,000 annually for three successive years. Each company is giving an equal share and all will benefit equally from the results.

A problem in metallurgy already has been suggested for the university to work out. It is expected to require a large part of the three years for completion, but if it should be finished before that time, another problem will be submitted. If the plan works satisfactorily and the results are encouraging, it probably will be continued after the three years. The research group of the nine concerns will meet regularly in Milwaukee to discuss shop problems and to confer with professors from the university on the progress of their experiments.

Announcing the acceptance of the gift, M. E. McCaffrey, secretary of the regents, said that just as the college of agriculture is assisting farmers in research work, so will the college of engineering aid manufacturers.

Chemical Properties of Crystals

The annual May lecture was delivered before the Institute of Metals in London on May 8 by Prof. C. H. Desch, on "The Chemical Properties of Crystals." After referring to the light thrown on the mechanical and physical properties of crystals by modern ideas as to the atomic structure of matter and the internal structure of the atom, the lecturer discussed the various ways in which atoms may be held together in a crystal by the simple exchange or sharing of electrons or by residual forces. In rock salt the molecule has disappeared, but there are many substances which are built up of molecules in the solid as well as in the liquid state. In a few simple cases it has been found possible to calculate the forces of attraction in a particular face of a crystal, and in that way the differing chemical properties of different faces possibly are explained. Such differences account for the varying habit of crystals of the same substance grown under different conditions.

When a metal is attacked by an acid, the surface is not dissolved uniformly, but distinct "etch-figures" are produced, and the shape of those must be intimately related to the internal structure of the metal crystals. The figures may vary in the most curious way when the solvent is changed, and that is shown most clearly by large single crystals of copper.

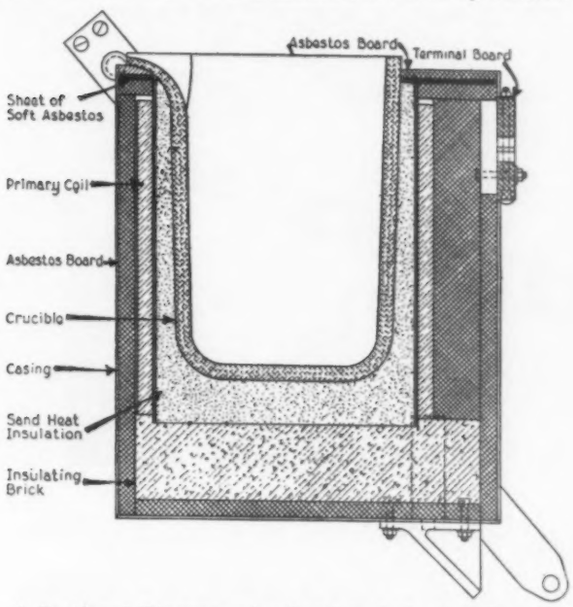
The compounds of metals with one another have puzzled chemists, as they do not follow the ordinary rules of valency, and have many anomalous properties. The modern view of the constitution of the atom makes it possible to explain them, and the relations which have been found between the forces of cohesion and of chemical affinity make it likely that there is a gradual transition from the simplest solid compounds, such as salts, through intermetallic and other compounds, to solid solutions which are regarded as mixtures.

The chemical properties of crystals are most easily illustrated by substances which do not consist of closely packed atoms, but have an open structure, such as graphite. Looseness of structure is also important for diffusion in solids, on which many technical processes depend.

New High-Speed Steel Made in Induction Furnace

British Firm Markets Tool Steels Made in Ajax-Northrup Furnace on Production Basis in 450-Lb. Heats

AN Ajax-Northrup high-frequency electric induction furnace with a capacity of 450 lb. per heat has been installed at the Imperial Steel Works of Edgar Allen & Co., Inc., Sheffield, England, and has replaced the crucible furnaces formerly used for the production of high-speed tool steels. The electrical installation consists of a 150-kva. motor-generator set, running at 3000 r.p.m. and delivering current at 1200 volts at a frequency of 2200 cycles. In order to improve the overall power factor a bank of condensers is installed to balance the current taken by the furnace. The furnace is said to take up to 900 amp. at a low lagging power factor, and the condensers are cut in by suitable



A Sectional Diagram of a Coreless Induction Furnace

switch gear to take a similar leading current. Circuit voltage is controlled by means of field rheostats at about 1200 volts.

The high-frequency current passes through a water-cooled copper coil in the walls of the furnace and is efficiently insulated from the hot contents by asbestos linings. The clay crucible is also surrounded with sand. Very little heat can therefore be radiated from the crucible except through the cover. (A cross section of a coreless induction furnace of this general type is shown in the illustration taken from a recent issue of *General Electric Review.*)

One Hour Completes 450-Lb. Heat

Operation of the furnace is roughly as follows: The pot is warmed up by placing a piece of steel in it and turning on the electric current. The current passing through the copper coil induces eddy currents in the piece of steel in the pot. The currents heat the steel rapidly. When the heating is considered to be sufficient, the current is turned off, and the pot is allowed to absorb some of the heat. After this has been continued in brief alternations until the crucible is at a good temperature, the rest of the material to be melted is charged into the pot. Current is turned on, and in about an hour a full heat of 450 lb. of steel (which is the capacity of the furnace) is melted and ready to be cast into ingots. The current consumption for the first heat is at the rate of about 950 kva. per ton of ingots, and for subsequent heats at about 850 kva. per ton.

As soon as the metal contained in the pot is molten it circulates rapidly in a vertical plane, so its composition is maintained constant in all parts. Furthermore it is uncontaminated by gases of combustion or by carbon from electrodes. It is said that this vigorous mixing in a gas-free atmosphere has led the Ajax-Northrup furnace to be favored for laboratories for the ease with which experimental steels of definite analyses can be made up and cast. There is obviously no wear on the outside of the clay pot, which is so severe in the crucible steel furnace, but the circulation of the molten metal has a pronounced scouring action on its interior. Comparative figures taken from operation of a Heroult arc furnace operating on tool steels at the Sheffield steel plant show that electrode expense and cost of clay pots will be about the same.

Advantages Over Crucible Process

According to S. J. Hewitt, chief metallurgist Edgar Allen & Co., the advantages of the new furnace "over the crucible furnace are the smaller space necessary for its installation and its lower estimated cost of production, although the latter has not been finally proved yet, owing to the furnace's not having been worked to its full capacity. The resultant steel is also free from outside impurities, such as are common to the crucible process. The quickness of melting combined with the ease of control make it a remarkably useful and convenient method of melting."

It is interesting to note that this British firm, which has had extensive experience in fine steel making by both Huntsman's crucible process and Heroult's electric furnace, have issued trade literature claiming that the Ajax-Northup induction furnace produces steel of conventional analyses much superior than either of its predecessors. To quote them:

"The explanation is simple.

"(1) There is no contamination of the steel by gases, fuel or carbon electrodes. Sulphur and phosphorus, those deadly enemies of the steel maker, are eliminated to a greater extent than has ever before been possible.

"(2) Furthermore, there is a violent stirring of the molten metal electrically, which results in a thorough diffusion of the ingredients throughout the entire mass. This gives the steel greater homogeneity."

High-Speed Steel of Extra Durability Made in Induction Furnace

Special qualities are also claimed for a new brand of tool steel (called "Stag Major") made in this furnace. Whether it is substantially different in analysis from the tungsten-chromium-vanadium high-speed steels which are most favored in America, or from the English maker's other brands, is not clear from the description given. At any rate, it is said to be heat treated exactly as other high-speed steels.

Tests on single roughing lathe tools made by the Sheffield testing works gave the following results:

All tests:
- Speed, 65 ft. per minute.
- Depth, 3/16 in.
- Feed, 1/16 in.
- Lubricant, none.
- Steel cut: 0.71 per cent carbon, normalized bar, Brinell hardness 235.

Time for failure:

14 per cent "Tungsten High-Speed Steel"	4 min. 30 sec.
18 per cent "Tungsten High-Speed Steel"	8 min. 12 sec.
"Special Super High-Speed Steel"	14 min. 6 sec.
"Stag Major High-Speed Steel"	23 min.

The Youngstown Sheet & Tube Co. has called a special stockholders' meeting for June 25 to approve a new issue of 250,000 shares of $100 par value preferred stock. Of this number, it is proposed to issue at this time 150,000 shares, to be designated as "Series A" bearing an annual dividend rate of 5½ per cent, and subject to redemption of $105 per share upon 30 days' notice. Present outstanding 7 per cent preferred has been called for redemption July 1, 1928.

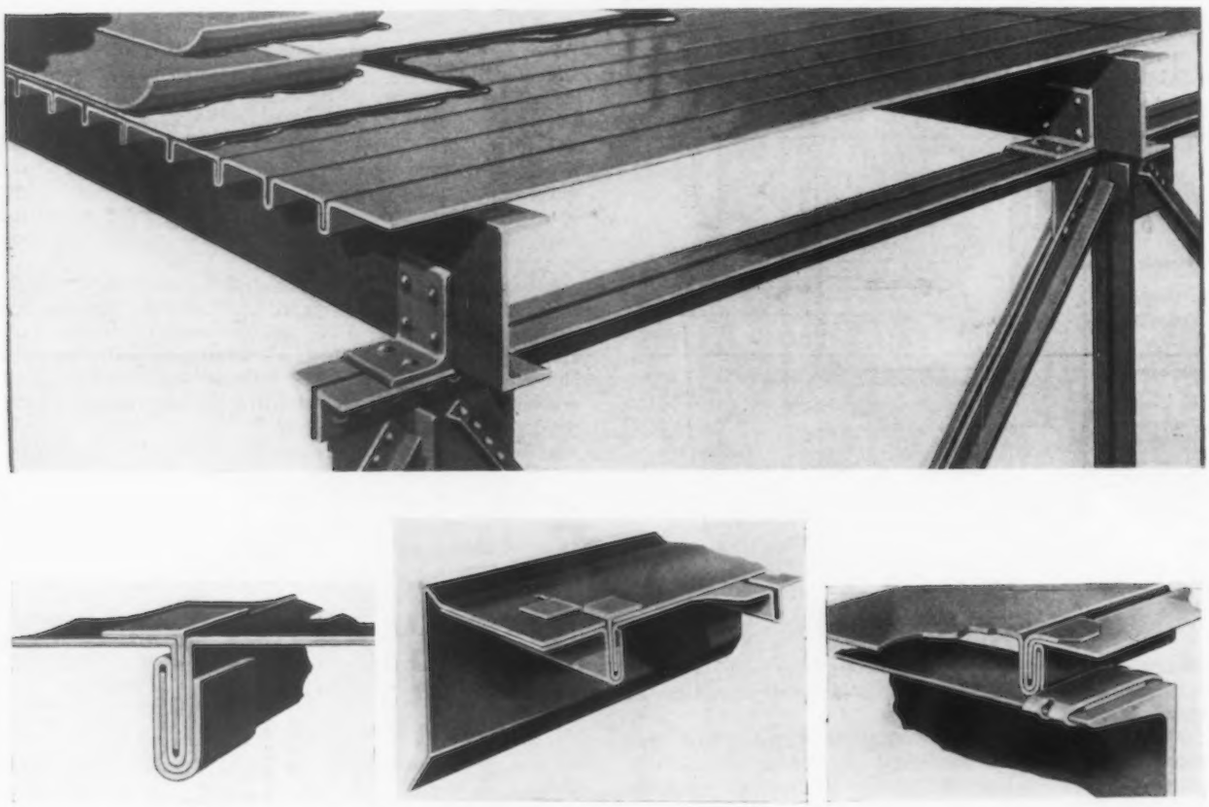
Steel Roofing System Erected with Standard Clips

A STEEL roof deck placed on the market by the R. C. Mahon Co., Detroit, and designed to be covered with water-proofing materials, is put out in standard sections with three standard clips, respectively for attaching to the purlins, for locking the plates together between purlins and for attaching flashings. Details of the attachments and of the standard plate are shown in the illustration.

All lap joints occur directly over the purlin, there being no end fittings in the installation. It is stated that the only tool needed to apply this deck is an ordinary hammer. The deck plate is furnished in copper-bearing steel No. 18 and 20 gage, painted a standard light gray. It can be furnished also in galvanized steel. The company has established No. 20 gage as the minimum thickness for satisfactory service.

When completed the deck functions as a single steel plate, as the separate units, when assembled, become an integral part of one interlocking whole. The end lap over purlins is standardized at 2 in., the plates being 12 in. wide with an intermediate rib 1½ in. deep. Every second rib, where adjacent sheets interlock, provides three thicknesses of metal. Each plate is locked with clips to the adjoining plate, to prevent sagging of individual plates from local loads. This feature avoids loosening of bond between the deck and the insulation or finish above it.

Included in the design are arrangements for taking care of saddles, flashings, fill, etc. Details have been worked out for a considerable variety of cases, including those in which ventilator openings go up through the roof, also where strainers and sumps are provided in the saddle, and where monitors, sawtooth construction and other roof types are used.



FOUR Standard Members Form the Entire Roof Above the Purlins. In the assembly view at top the ribbed deck plates are shown; below are the three forms of clips. That at left is the "intermediate" clip, used for locking the roof deck plates together midway between purlins. In center is the "flashing" clip, for attaching flashing to the deck plates. At right is the "beam" or "purlin" clip, for attaching the deck plates to the purlins, in this case a channel

Birmingham Producers Protest Consolidated Southwestern Decision

WASHINGTON, June 5.—A protest against the decision of the Interstate Commerce Commission in the Consolidated Southwestern cases has been filed by the Alabama Iron and Steel Shippers' Conference, Birmingham, an association of iron and steel producers, which contends that the relationships prescribed on manufactured iron and steel from Alabama producing points are not justified. The petition asks that the commission modify the decision to prescribe the same scale from Birmingham and other Alabama producing points as from Chicago and other points in Central territory. It suggests that this be done by providing a maximum scale from the Alabama points and, if necessary, a minimum scale from producing points in Central territory. It is further urged that the commission revise the grouping of the Southwestern destinations so that there will be a uniformity of the relationships, distance for distance, between the Alabama producing points on the one hand and the producing points in Central territory on the other.

The decision, which has been protested by Northern iron and steel producers also, changed the long existing adjustment of iron and steel rates to the Southwest territory, and applied a grouping arrangement based on a mileage scale which, from Birmingham and other Alabama producing points, is different and on a higher level than from producing points in the competing territory on and north of the Ohio River. The commission, when considering this point previously, declared that the differences "are no greater than necessarily result from the application of river crossing allowances at crossings south of Cairo."

Machinery Exports Continue Heavy

Four-Month Total Over $10,000,000 Ahead of Last Year—Imports About Same as in 1927

WASHINGTON, June 2.—Exports of machinery of all kinds from the United States in April were valued at $37,375,868, compared with $42,372,463 in March and with $39,771,065 in April of last year. For the four months ended with April the value was $151,951,340, against $141,739,716 for the corresponding period of last year. Exports of industrial machinery in April, 1928, were valued at $17,412,396, against $19,026,074 in March, while the value for April of last year was $18,940,682. For the four months ended with April exports of industrial machinery were valued at $68,901,637, compared with $67,986,656 for the first four months of 1927.

Exports of all power-driven metal-working machinery in April were valued at $1,827,938, against $1,960,407 in March and $1,796,305 in April of last year. For the first four months of the present year and 1927 the values were $7,818,034 and $5,737,327, respectively. Exports of power-driven metal-working machinery listed in THE IRON AGE table totaled 696 units, valued at $998,344, in April, against 740, valued at $1,103,000, in March.

Total imports of machinery and vehicles in April were valued at $2,427,259, against $2,433,564 in March and $2,667,832 in April of last year. For the four months of 1928 and 1927 the values were $8,977,710 and $9,649,088, respectively. Imports of machinery listed in THE IRON AGE table were valued at $1,935,751 in April, against $1,819,672 in March and $1,840,203 in April of last year. For the four months of the current year the value was $6,709,473, against $6,683,006 for the corresponding period of last year. Imports of industrial, office and printing machinery in April were valued at $1,378,840, against $1,404,786 in March and $1,416,598 in April of last year. For the four months of the present year and 1927 the values were $5,227,413 and $5,372,970 respectively.

German Firm Now Offering 15 Types of Steel Dwellings

WASHINGTON, June 5.—Steel dwelling houses are now offered for sale by a firm in Gleiwitz, Upper Silesia, Germany, where they are manufactured, according to a special circular just issued by the iron and steel division, Department of Commerce, and based on a report prepared by Lester L. Schnare, consul, Breslau. The circular is one of a number circulated by the division regarding the growth of steel house construction in Europe. The Gleiwitz firm has published a catalog describing 15 types of steel dwelling houses which it is prepared to sell and is attempting to introduce in southeastern Germany. So far it is the only firm in Silesia to undertake construction of dwelling houses of steel. The circular details specifications of the types of houses built, and it is stated that they are so constructed that they may be taken down and moved quickly and easily, thus making them suitable for use on construction jobs and for similar purposes where permanence is not a requisite.

Machinery Exports from the United States

(By Value, in Thousands of Dollars)

	April		Four Months Ended April	
	1928	1927	1928	1927
Locomotives	$147	$90	$779	$3,542
Other steam engines	71	104	232	818
Boilers	62	135	323	669
Accessories and parts	127	233	550	750
Automobile engines	1,685	1,591	5,163	4,733
Other internal combustion engines	624	656	2,328	1,919
Accessories and parts	365	298	1,184	1,414
Electric locomotives	61	312	571	438
Excavating machinery	632	467	2,596	1,547
Concrete mixers	98	100	328	408
Road-making machinery	178	251	620	621
Elevators and elevator machinery	388	423	1,161	1,626
Mining and quarrying machinery	986	1,520	4,108	4,743
Oil well machinery	1,141	2,861	4,518	7,553
Pumps	479	628	1,720	2,134
Bending and power presses	131	123	531	382
Machine tools*	1,042	1,103	4,529	3,494
Forging machinery	44	53	255	278
Other metal-working machinery and parts	484	453	1,881	1,511
Textile machinery	979	950	4,350	3,512
Sewing machines	692	926	2,880	3,258
Shoe machinery	145	148	626	470
Flour-mill and gristmill machinery	40	38	166	134
Sugar-mill machinery	118	281	1,570	910
Paper and pulp mill machinery	301	220	1,252	739
Sawmill machinery	64	230	303	1,688
Other woodworking machinery	164	84	596	415
Refrigerating and ice-making machinery	797	645	2,445	1,177
Air compressors	488	709	1,982	1,916
Typewriters	1,736	2,070	7,426	7,179
Power laundry machinery	82	147	334	575
Typesetting machines	335	444	1,443	1,355
Printing presses	268	431	1,911	2,056
Agricultural machinery and implements	8,388	8,049	33,575	26,911
All other machinery and parts	14,036	12,996	57,315	50,863
Total	$37,376	$39,771	$151,951	$141,739

*Principal items detailed in another table.

Exports of Power-Driven Metal-Working Machinery

	April, 1928		March, 1928	
	No.	Value	No.	Value
Engine lathes	39	$78,449	95	$143,373
Turret lathes	41	56,602	29	93,995
Other lathes	125	159,525	33	34,295
Vertical boring mills and chucking machines	8	7,720	12	23,125
Thread-cutting and automatic screw machines	64	78,357	90	124,902
Knee and column type milling machines	19	36,746	33	97,243
Other milling machines	43	109,522	47	115,442
Gear-cutting machines	30	64,481	26	59,044
Vertical drilling machines	62	38,491	75	23,423
Radial drilling machines	8	39,574	16	53,337
Other drilling machines	71	32,241	80	14,715
Planers and shapers	46	84,802	37	64,787
External cylindrical grinding machines	59	143,088	81	159,396
Internal grinding machines	37	43,956	38	69,356
Metal-working tool-sharpening machines	44	24,790	48	26,567
Total	696	$998,344	740	$1,103,000

Imports of Machinery into the United States

(By Value)

	April		Four Months Ended April	
	1928	1927	1928	1927
Metal-working machine tools	$46,690	$20,735	$215,078	$165,152
Agricultural machinery and implements	598,332	758,635	2,072,033	2,588,110
Electrical machinery and apparatus	229,651	180,885	757,495	513,457
Other power-generating machinery	3,767	2,252	32,070	22,187
Other machinery	836,875	630,358	2,712,028	2,649,450
Vehicles, except agricultural	220,436	247,338	920,769	744,650
Total	$1,935,751	$1,840,203	$6,709,473	$6,683,006

CONTENTS

June 7, 1928

Cupola Fired with Powdered Coal 1593

Enlarging Steel Mill Possibilities 1596

Bronze Bearings for Heavy Duty 1599

East Chicago Trains Apprentices 1601

Powdered Coal in Steel Furnaces 1603

Power and Other Steel Mill Problems 1605

Safety in the Machine Shop 1610

Pig Iron Output in May Close to April Rate 1628

Machines for Testing Wire Rope 1598
Solubility of Iron Oxide 1602
Welding on Buildings 1604
Waste-Heat Boilers in Steel Mill 1605
Steel Works Power and Blowing Plant. 1606
Quality Factors in Basic Open-Hearth .. 1606
Factory Transportation 1609
To Build New Tube Plant 1609
Shipyard Conducts Safety Campaign .. 1611
To Exhibit Steel Mill Novelties 1614
Steel Treaters Name New Officers 1618
Foundry Research Fund Established ... 1618
Chemical Properties of Crystals 1618
High-Speed Steel in Electric Furnace .. 1619
Railroad Freight Rate Cases 1620, 1652
Germans Building Steel Dwellings 1621
Lathe Makers to Charge for Service ... 1627
To Build American Passenger Ships ... 1627
Electric Apparatus Makers Merge 1627
American Engineering Standards Committee 1627
Navy Auctions Scrap and Tools 1629
Over-Capacity No Alibi on Price Cutting 1649
Backed-Up Strip Rolls in Favor 1651
German Tests of Wire Rope 1652
Yale & Towne Buy German Plants 1655
New Trade Publications 1664

STATISTICAL

Fewer Accidents in Metal Industries .. 1595
Steel Works Employment Slightly Lower 1618
Machinery Exports Continue Heavy ... 1621
Exports of Aircraft and Parts 1629

NEW EQUIPMENT

Drilling and Countersinking Hinges ... 1612
Core Machine for Ease of Operation ... 1612
Anti-Friction Center for Heavy Loads .. 1612
Two-High Hot Strip Mill 1613
Swiveling Crane of Unusual Type 1613
Draw-Cut Planer for Railroad Work .. 1614
Double-End Drill with Ball Bearings .. 1614
Electrically Welded Chain for Hoist ... 1614
Racks for Shop Records 1615
Improved Combination Bevel 1615
Numbers Parts with Curved Surfaces .. 1615
Self-Contained, Adjustable Die Stocks. 1616
Improved Plating Tank Rheostat 1616
Portable Pneumatic Rod Grinder 1616
Finishing Milling Machine 1617
High-Frequency Electric Grinders 1617
Steel Roofing System Erected with Standard Clips 1620

MEETINGS

Industrial Advertisers' Conference 1600
International Bituminous Coal Conference 1602
American Iron and Steel Institute 1605
New York Structural Engineers 1641
Eastern States Blast Furnace and Coke Oven Association 1651

DEPARTMENTS

Editorial 1624
Iron and Steel Markets 1630
Comparison of Prices 1631
Prices, Raw and Finished Products. 1633-1635
Non-Ferrous Metals 1647
Railroad Equipment Buying 1648
Reinforcing Steel Business 1648
Structural Awards and Projects 1649
Personals 1650
Obituary 1652
European Steel Markets 1653
Machinery Markets 1656

This Issue in Brief

Accident rate in metal industries drops 25 per cent. In 1927 the number of accidents per million hours of exposure was 26.59, as compared with 35.45 in 1926. Severity rate was sharply reduced also. — Page 1595.

Improves quality of gray iron castings and cuts fuel cost 50 per cent by firing cupola with powdered coal. Sulphur is reduced 20 to 30 per cent; total carbon is about 20 per cent less, and transverse strength and deflection of castings are about 15 per cent higher. The powdered coal is burned outside the cupola shell proper and the hot gases are fed to the melting zone.—Page 1594.

Too many oil grooves spoil the bearing, says bearing manufacturer. Every groove reduces the bearing area. Groove edges should be chamfered; otherwise the sharp edges will scrape the oil film off the shaft.—Page 1599.

Joint apprentice-training system is operating successfully in East Chicago. Under the supervision of the Chamber of Commerce, eight manufacturers conduct a community training program, which provides for shop, shop school, and high school instruction.—Page 1601.

Open-hearth difficulty with silicon comes not from high or from low silicon in the pig iron, but from a *change* in silicon content, either up or down. When the silicon content is approximately stable, good results are obtained in the steel.—Page 1602.

Production cost of high-speed steel will be lower in new electric furnace, metallurgist believes. In new high-frequency electric induction furnace, the current passes through a water-cooled copper coil in the walls, and is insulated from the hot contents by asbestos linings. A heat is completed within one hour.—Page 1619.

Machinery exports fall 7 per cent. April shipments out of country were valued at 37.4 million dollars. But shipments for first four months of year were more than 6 per cent above same period of 1926. — Page 1621.

Arc welding will soon be used on most structural jobs, structural engineer believes. Field work offers opportunities for the larger welding operations, he says, since many structural conditions are best met by that process.—Page 1604.

Perhaps it will be more economical to improve or replace the primary unit rather than to buy equipment to convert the waste heat into steam. When steam thus generated is not required, or when it is in excess of demands, study of returns from waste-heat recovery installation costs is apt to decide against such recovery.—Page 1605.

To guard against accidents, hoisting chains should be annealed at least once a year, says manufacturing executive. In addition, it is a good plan to have them tested at intervals by the chain manufacturer.—Page 1610.

You can not make good steel from inferior raw materials, says open-hearth man. A definite amount of carbon in the charge is necessary to melt and refine it. Sulphur and phosphorus can be removed from the bath in small amounts only, so that care should be used in limiting the quantities going into the furnace.—Page 1607.

Improved accuracy in machining operations removes the need for plasticity in the bearing metal, says bearing manufacturer. Harder steels call for harder bearings, giving longer life, he says. To get the right bronze for the particular application requires a careful study of all factors.—Page 1599.

Open-hearth furnaces heated with pulverized fuel are operated with no more difficulty than with producer gas, but not so simply as when oil is the fuel. By substituting arches for [illegible], Eastern steel maker has solved the difficulty of checkers filling up with ash.—Page 1603.

"Teeming speed is the most important factor in steel-making," says British steel man. Slow pouring allows the metal to cool and to free itself of gases. Minimum satisfactory pouring time of 7200-lb. ingots is 6 min., he believes.—Page 1608.

New electric melting furnace will be elliptical in shape, 20 x 29 ft. Timken furnace will have six electrodes instead of three, in two groups of three each.—Page 1596.

"Competition never seriously presses those concerns which are distinguished by superior productive ability." By failure to utilize low-cost equipment and methods, many concerns find themselves "profitless" even in times of good business. As they continue to ignore improved methods, they not only stand still but really go backward, relative to the advance of their more progressive competitors.—Page 1625.

Accident rate among foreign-born employees proves six times that among native born workers. Examination of records of large plant reveals also that accident rate is less with newly employed men than with those of longer service.—Page 1625.

Lathe builders will charge for service on each machine sold. When service charges are included in the price of the machine, the buyer who makes unreasonable demands profits at the expense of the fair buyer, the lathe builders say.—Page 1627.

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor* — W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President* — George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred O. Stevens, *Treas.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: 408 Union Central Building. Buffalo: 835 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

Flying Apace

TRULY the aviation industry goes at a breathless pace. In the morning's paper is first-page news about a trans-Pacific flight, trans-Atlantic flyers, and Lindbergh's surveys for the air-rail transcontinental passenger service. In the morning's mail is a news release from Carnegie Institute of Technology announcing extensive plans for an aeronautical engineering branch of the Department of Mechanical Engineering, in which more than half the sophomore class wishes to enroll. The same mail brings the "Aeronautics Trade Directory" from the United States Department of Commerce, and in it we see that there are already ten universities and engineering colleges which have preceded Carnegie in the new educational fashion.

Or, if you prefer to study at home, one of 17 correspondence courses is at your service. If you only want to know how to fly, without being bothered with theory of fluid flow and such abstruse matters, why then the addresses of ground and flying schools run to seven columns; they are found in every State in the Union.

After learning to fly you can get advice from 19 consulting aeronautical engineers and one consulting meteorologist; 18 insurance companies will write your policies; you can belong to 8 associations or subscribe to 23 magazines. You may buy a plane from any one of 113 manufacturers who are represented by an appropriately long list of distributers and dealers. You can buy special aeronautical first-aid kits from no less than three houses; and parachutes from the same number; also accessories and specialties too numerous to mention.

But, of course, you need a metal hangar. Forty-four firms specialize in such constructions. If you come to grief, 56 general service and repair firms (possibly for major operations) will patch you up; minor adjustments may be done at hundreds of airports.

Perhaps you want your flying done for you. Very well; there is a list which takes up 19 columns, of men and firms who will carry your mail or parcels, who will taxi you about or conduct sight-seeing parties, who will advertise and sky-write for you, spray your orchards or dust your crops, do stunts and loop the loops, take your photographs from above, or survey and map any region on the earth's surface in which you are interested.

Who wants to walk?

Exit the "Vicious Circle"

COMMENT on the economic aspects of business often used to employ terms like "vicious circle" or "ascending spiral" or "descending spiral." It is noteworthy that in recent years such references have not been made and would have been quite unfitting, for the steadiness of trade has been at once a satisfaction to business men and a cause of confusion among cyclical forecasters.

In the former time the railroads now and then called for higher freight rates, alleging higher wage costs, whereupon comment promptly arose that higher freight rates would mean higher living costs and fresh labor demands. Or a time would arise when employers in general were disposed to reduce wages, alleging low selling prices, and then would arise criticism that lower wages would mean decreased buying power, lower commodity prices still, and then fresh wage reductions, all in a "descending spiral."

The period of relative stability has now lasted so long that there is good reason to believe we are in a new order of things. The changes are largely associated with wage rates, but in more than one respect. Employers have come to recognize the general economic advantage of wages being maintained. Thereby buying power is sustained. Labor turnover is diminished. Employers in selecting men have improved on the old way of retaining the best in the periodic shaking out. On the other hand there has been no labor shortage to bring about unduly high wages or unsound competition between employers, necessitating shortly a downward readjustment.

The increasing mechanization of industry has played an important part in steadying both wage rates and prices. The competitor can see little advantage in reducing wages, for the relation be-

tween labor cost and capital cost is reduced and the importance of manning the machinery well is increased. While employers are to be commended for becoming more enlightened, no small part of the change is due simply to the march of events.

The comparative stability of wages in recent years furnishes its own testimony to there being no spiral, ascending or descending, in operation. The commodity price indexes furnish other testimony. The composites have fluctuated but little, and every time there has been an upward or downward swing some individual commodities have moved in the opposite direction, whereas those spirals of the old days involved everything moving more or less together. Also the building records have been showing a stability quite beyond the average prediction. Nobody nowadays seems to hasten a building project to escape a higher cost or to delay one to secure the benefit of a decline.

The Supply of Scrap

HEAVY melting steel scrap prices of late have been at their lowest levels since 1921; and as liquidation falls heavily upon scrap a more illuminating comparison is that scrap prices are but a shade above their pre-war level. Freight rates are much higher and were there not improvements in the handling of scrap it would be impossible in many cases to move it at present realized prices.

Several factors combine to cause such cheapness. Production statistics show that the proportion of works scrap to mill shipments of product has increased. We need not here consider how much progress has been made in producing sound ingots or how much more cropping must be done to supply present day steel quality, or whether mills carry their steel to a greater degree of finish than formerly. It is sufficient to observe from the statistics that, taking pairs of years to secure more representative averages, the proportion of rolled steel to ingots was 76.4 per cent in 1905-6, 76.2 per cent in 1912-13, and 74.0 per cent in 1925-6. Deducting a uniform scale loss there is represented about 11 per cent increase in works scrap per ton of ingots in about 20 years. Of course there is the important offset that production of Bessemer steel, which supplies scrap for associated open-hearth furnaces, has greatly decreased by the long-range comparison, but the large decrease occurred a good while ago, there being very little decrease in the last few years.

There is an increase in scrap supply, for somebody, by the decadence in production of rolled iron, which averaged 649,491 tons a year in the last three years against 2,148,878 tons 20 years earlier, when production of forge pig iron ran 669,468 tons a year and some of it was used in foundry work. Accordingly one may take it that over a million tons of scrap has been released by the iron rolling mills.

Then we have this very important principle, that if material returns as scrap a certain number of years after its production, the outcome of the latter has been increasing lately more rapidly than formerly, relative to the rate of steel production. Assume, for instance, that certain scrap arises after 20 years. Production of rolled iron and steel in 1895-6-7 was 33.3 per cent of that in 1905-6-7, but production in this second group of years was 55.3 per cent of that in 1925-6-7. Thus in the last 20 years there has been an increase in scrap relative to production of new material.

Finally, as the country becomes better filled with iron and steel the layer is denser, so to speak, and it is correspondingly easier to get at the scrap. But here arises the point that with higher freights and wages it may not pay to gather the scrap even though physically it is more accessible. It would seem therefore that the market price can go only so low and that thereupon the offerings of miscellaneous material would diminish.

The Devil Taking the Hindmost

DIFFERENT percentages of net profit are found among active producers in every competitive line of business. The prosperity of some is chronically "profitless," while others seem able to make money at all times. The production costs of the former are at or above the general level of net sales prices, while the latter are able to produce at costs low enough to afford them at least a reasonable percentage of profit. The two groups are marked off by the zone of marginal cost. As market conditions change, a few producers in the marginal zone move in one direction or the other, passing out of it into a situation of profit or of loss.

Better location or equipment and the use of better methods characterize the industrials which occupy the positions above the marginal cost line. As improved equipment and methods are continually developed, it follows that, by failing to acquire these, some producers must in due course find profitable competition impossible. By standing still they have gone backward. Yet, as we have heretofore pointed out, an enterprise once capitalized must generally be kept going and thus, to the hurt meanwhile of average competitors, the law of the survival of the fittest may work but slowly.

Aging equipment is rightly depreciated in book value; unprogressive management ought in some way to be written off also in the capital accounts. The depreciation allowance should be used to acquire better means of production just as fast as these become available.

Industries are almost always "overbuilt," if all plants possible of operation at any cost are included in the count. On the other hand, concerns which are distinguished by superior productive ability are never seriously pressed by competition.

A Study in Industrial Accidents

AN analysis has been made of disabling accidents which occurred in a year in a metal-working plant employing about 5000 men. Chief among the conclusions drawn are these: That the accident rate was much higher among foreign born workers than among native born; that newly employed men had a lower rate than those of longer service; that the blame for 87 per cent of the accidents rested with the injured man; and that machines in motion were responsible for less than one-fourth as many accidents as were caused in the handling of material.

In the year this plant had 68 disabling accidents, including two fatalities. The total of lost time was 3600 days, reckoning nothing where death resulted. This excellent record was due, to

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor* — W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York
C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President* — George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred O. Stevens, *Treas.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: 408 Union Central Building. Buffalo: 835 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.
PRINTED IN U. S. A.

Flying Apace

TRULY the aviation industry goes at a breathless pace. In the morning's paper is first-page news about a trans-Pacific flight, trans-Atlantic flyers, and Lindbergh's surveys for the air-rail transcontinental passenger service. In the morning's mail is a news release from Carnegie Institute of Technology announcing extensive plans for an aeronautical engineering branch of the Department of Mechanical Engineering, in which more than half the sophomore class wishes to enroll. The same mail brings the "Aeronautics Trade Directory" from the United States Department of Commerce, and in it we see that there are already ten universities and engineering colleges which have preceded Carnegie in the new educational fashion.

Or, if you prefer to study at home, one of 17 correspondence courses is at your service. If you only want to know how to fly, without being bothered with theory of fluid flow and such abstruse matters, why then the addresses of ground and flying schools run to seven columns; they are found in every State in the Union.

After learning to fly you can get advice from 19 consulting aeronautical engineers and one consulting meteorologist; 18 insurance companies will write your policies; you can belong to 8 associations or subscribe to 23 magazines. You may buy a plane from any one of 113 manufacturers who are represented by an appropriately long list of distributers and dealers. You can buy special aeronautical first-aid kits from no less than three houses; and parachutes from the same number; also accessories and specialties too numerous to mention.

But, of course, you need a metal hangar. Forty-four firms specialize in such constructions. If you come to grief, 56 general service and repair firms (possibly for major operations) will patch you up; minor adjustments may be done at hundreds of airports.

Perhaps you want your flying done for you. Very well; there is a list which takes up 19 columns, of men and firms who will carry your mail or parcels, who will taxi you about or conduct sight-seeing parties, who will advertise and sky-write for you, spray your orchards or dust your crops, do stunts and loop the loops, take your photographs from above, or survey and map any region on the earth's surface in which you are interested.

Who wants to walk?

Exit the "Vicious Circle"

COMMENT on the economic aspects of business often used to employ terms like "vicious circle" or "ascending spiral" or "descending spiral." It is noteworthy that in recent years such references have not been made and would have been quite unfitting, for the steadiness of trade has been at once a satisfaction to business men and a cause of confusion among cyclical forecasters.

In the former time the railroads now and then called for higher freight rates, alleging higher wage costs, whereupon comment promptly arose that higher freight rates would mean higher living costs and fresh labor demands. Or a time would arise when employers in general were disposed to reduce wages, alleging low selling prices, and then would arise criticism that lower wages would mean decreased buying power, lower commodity prices still, and then fresh wage reductions, all in a "descending spiral."

The period of relative stability has now lasted so long that there is good reason to believe we are in a new order of things. The changes are largely associated with wage rates, but in more than one respect. Employers have come to recognize the general economic advantage of wages being maintained. Thereby buying power is sustained. Labor turnover is diminished. Employers in selecting men have improved on the old way of retaining the best in the periodic shaking out. On the other hand there has been no labor shortage to bring about unduly high wages or unsound competition between employers, necessitating shortly a downward readjustment.

The increasing mechanization of industry has played an important part in steadying both wage rates and prices. The competitor can see little advantage in reducing wages, for the relation be-

tween labor cost and capital cost is reduced and the importance of manning the machinery well is increased. While employers are to be commended for becoming more enlightened, no small part of the change is due simply to the march of events.

The comparative stability of wages in recent years furnishes its own testimony to there being no spiral, ascending or descending, in operation. The commodity price indexes furnish other testimony. The composites have fluctuated but little, and every time there has been an upward or downward swing some individual commodities have moved in the opposite direction, whereas those spirals of the old days involved everything moving more or less together. Also the building records have been showing a stability quite beyond the average prediction. Nobody nowadays seems to hasten a building project to escape a higher cost or to delay one to secure the benefit of a decline.

The Supply of Scrap

HEAVY melting steel scrap prices of late have been at their lowest levels since 1921; and as liquidation falls heavily upon scrap a more illuminating comparison is that scrap prices are but a shade above their pre-war level. Freight rates are much higher and were there not improvements in the handling of scrap it would be impossible in many cases to move it at present realized prices.

Several factors combine to cause such cheapness. Production statistics show that the proportion of works scrap to mill shipments of product has increased. We need not here consider how much progress has been made in producing sound ingots or how much more cropping must be done to supply present day steel quality, or whether mills carry their steel to a greater degree of finish than formerly. It is sufficient to observe from the statistics that, taking pairs of years to secure more representative averages, the proportion of rolled steel to ingots was 76.4 per cent in 1905-6, 76.2 per cent in 1912-13, and 74.0 per cent in 1925-6. Deducting a uniform scale loss there is represented about 11 per cent increase in works scrap per ton of ingots in about 20 years. Of course there is the important offset that production of Bessemer steel, which supplies scrap for associated open-hearth furnaces, has greatly decreased by the long-range comparison, but the large decrease occurred a good while ago, there being very little decrease in the last few years.

There is an increase in scrap supply, for somebody, by the decadence in production of rolled iron, which averaged 649,491 tons a year in the last three years against 2,148,878 tons 20 years earlier, when production of forge pig iron ran 669,468 tons a year and some of it was used in foundry work. Accordingly one may take it that over a million tons of scrap has been released by the iron rolling mills.

Then we have this very important principle, that if material returns as scrap a certain number of years after its production, the outcome of the latter has been increasing lately more rapidly than formerly, relative to the rate of steel production. Assume, for instance, that certain scrap arises after 20 years. Production of rolled iron and steel in 1895-6-7 was 33.3 per cent of that in 1905-6-7, but production in this second group of years was 55.3 per cent of that in 1925-6-7. Thus in the last 20 years there has been an increase in scrap relative to production of new material.

Finally, as the country becomes better filled with iron and steel the layer is denser, so to speak, and it is correspondingly easier to get at the scrap. But here arises the point that with higher freights and wages it may not pay to gather the scrap even though physically it is more accessible. It would seem therefore that the market price can go only so low and that thereupon the offerings of miscellaneous material would diminish.

The Devil Taking the Hindmost

DIFFERENT percentages of net profit are found among active producers in every competitive line of business. The prosperity of some is chronically "profitless," while others seem able to make money at all times. The production costs of the former are at or above the general level of net sales prices, while the latter are able to produce at costs low enough to afford them at least a reasonable percentage of profit. The two groups are marked off by the zone of marginal cost. As market conditions change, a few producers in the marginal zone move in one direction or the other, passing out of it into a situation of profit or of loss.

Better location or equipment and the use of better methods characterize the industrials which occupy the positions above the marginal cost line. As improved equipment and methods are continually developed, it follows that, by failing to acquire these, some producers must in due course find profitable competition impossible. By standing still they have gone backward. Yet, as we have heretofore pointed out, an enterprise once capitalized must generally be kept going and thus, to the hurt meanwhile of average competitors, the law of the survival of the fittest may work but slowly.

Aging equipment is rightly depreciated in book value; unprogressive management ought in some way to be written off also in the capital accounts. The depreciation allowance should be used to acquire better means of production just as fast as these become available.

Industries are almost always "overbuilt," if all plants possible of operation at any cost are included in the count. On the other hand, concerns which are distinguished by superior productive ability are never seriously pressed by competition.

A Study in Industrial Accidents

AN analysis has been made of disabling accidents which occurred in a year in a metal-working plant employing about 5000 men. Chief among the conclusions drawn are these: That the accident rate was much higher among foreign born workers than among native born; that newly employed men had a lower rate than those of longer service; that the blame for 87 per cent of the accidents rested with the injured man; and that machines in motion were responsible for less than one-fourth as many accidents as were caused in the handling of material.

In the year this plant had 68 disabling accidents, including two fatalities. The total of lost time was 3600 days, reckoning nothing where death resulted. This excellent record was due, to

a large extent, to years of persistent training of employees in accident prevention and in use of all possible safeguards. It was considered that the victims were to blame in 59 accidents, only four being due to negligence of fellow employees, while four were classed as unavoidable. Machines in motion caused 9 accidents, and the handling of material 38, to which might be added 4 caused by material falling. Of the injuries sustained, 19 were fractures, 10 eye injuries, 8 contusions, and 7 that bane of workmen's compensation, strained back, which occurs in genuine form, naturally, but is also a favorite excuse for protracted malingering.

The wide difference in hazard between native and foreign born was astonishing. Of the 5000 employees 35 per cent or 1750 are native born. Of these only 5 suffered a disabling accident, making the rate 0.3 per 100 workers. The 3250 foreign born had 63 accidents, making their rate 1.9 per 100 or more than six times that of the native born. However, the foreign workers on the average have the more hazardous tasks. Also, a certain percentage of them had inadequate knowledge of English, which was a handicap in the training given them with the purpose of reducing their hazard.

A study of the accidents in their relation to hours of the working day brought out an anomalous situation. In the year 9 accidents occurred between 7 and 9 a. m., or 4½ per hour, and 21 accidents between 9 a. m. and 12 m., or 7 per hour. Such an increase is commonly attributed to increasing fatigue. In the 12 months there were 8 accidents between 1 and 3 p. m., or 4 per hour, and 13 between 3 and 6 p. m. or 4 1/3 per hour. It will be noted that the accident frequency in the concluding period of the day was less than in the opening morning period, when fatigue is not supposed to exist.

Men employed less than one year, numbering about 500, had 6 accidents, or 1.2 per 100; those with length of service from one to ten years, numbering about 2000, had 36 accidents, or 1.8 per 100; those whose service was more than ten years, constituting about one-half the entire force, had 26 accidents, or a trifle over 1 per 100. The rate for all men with more than one year of service was 1.32 per 100. The conclusion, if the ratios may be considered to prevail year after year, is that the novice in a plant is inclined to be careful and to take few unnecessary chances. In the following years he is not so safe a risk. Then, with maturity, comes caution.

Industry and the Graduate

FROM the head of an important Indiana company in the metal trades the request came recently to THE IRON AGE for copies of editorial comment which our correspondent had seen in these columns on the relationship between the college and industry. Various clippings were sent from this office and in acknowledging them this executive writes:

> I find that the editorial I wanted was in the Oct. 14, 1926, issue and was entitled "What Industry Wants in the Graduate." This is so good that I think it ought to printed again. There must be other fathers who have sons at college and many of these sons are doubtless groping for the right path. I am sure if the editorial could be reprinted it would benefit many sons and fathers, for the father does not always know and has to go through the experience of learning how to deal with a son.

Seeing that in the next fortnight thousands of young men are to go out from American colleges, it is appropriate to give our readers again the expressions which this Indiana manufacturer finds of value, and we are glad to comply with his request by reprinting the editorial of Oct. 14, 1926, herewith:

What Industry Wants in the Graduate

At recent meetings of the Mining and Metallurgical Engineers and the Steel Treaters there have been gatherings of men interested in metallurgical education. A large majority of those who attended the sessions devoted to this subject are actively engaged in teaching and doubtless this visible interest by college faculties is in part due to the investigation of engineering education now in progress under the direction of Mr. Wickenden. From the discussions one would gather that the uppermost question in educators' minds is, "What does industry want us to teach engineering students?"

A clew to the answer might be found in the audience which listens to these discussions. If the metallurgical industries were suffering from a lack of educated men, no doubt there would be a greater representation of industrialists at these conferences. No evident interest in the matter is equivalent to saying: "We have no constructive suggestions to offer; the average college graduate is good raw material."

As a matter of fact, are not the college authorities placing the wrong emphasis upon their industrial contacts? They should have learned by this time that a school of learning cannot produce specialists for industry. Each position is unique; only broad fundamentals are common to all. Hence this call upon the graduates and employers to consider details of the curriculum is of only passing significance. The colleges eventually will view the task primarily as the production of cultured citizens and secondarily as the production of high-salaried executives.

Some time back a committee was appointed by the American Institute of Mining and Metallurgical Engineers to canvass the situation and arrive at an answer to the question, "What does our industry look for in the college graduate?" Numerous prominent managers replied to the questionnaire. Their requirements of the technical subordinate were something like this: He must have integrity and loyalty. He must be clean and a good citizen; he must be energetic; he must be well grounded in the fundamentals of science. Not a word about special courses in mine timbering, flotation, steel refining, heat treatment. The answers are undoubtedly typical of those which would be given by any large employer in any line: the junior members must be men of character and ability.

College faculties will find, therefore, that the requirements of the industries are no different from the requirements of the professions, of the arts or of the state. All want men of character and ability. Whenever a college is so managed that it builds these two attributes, it is fulfilling its mission admirably.

The live questions are not specialization in the courses of study so much as wide discretion in electives and numbers of "snap" courses; not so much what the XYZ Mfg. Co. thinks of the testing laboratory as what the attitude on the campus is toward cribbing in quizzes; not so much the success of the football team as an atmosphere which encourages work, study and clean living.

This does not mean that we advocate a return to

the excessive Greek and Latin of a half century ago. Science, of course, is the foundation of all engineering curricula. Agricultural students will undoubtedly spend much time on plant and animal life; the architect will be more interested in external form, and the civil engineer will learn about the strength of materials. Such specialization is obvious. But a good undergraduate spirit, an inspired faculty and a president with vision are far more to be desired by industry than special courses leading to this, that or the other degree.

Lathe Builders to Guarantee Tools and Exact Service Charge

The National Machine Tool Builders' Association announces that the lathe group of the association has decided that each manufacturer shall give a six months' guarantee with each machine sold and will charge for services of erectors and demonstrators, this charge to be on a daily rate and to include railroad fare, hotel bills and other incidental expenses.

"The machine tool builders recognize that competent users of machine tools are not given to making unfair demands," says a statement by the association, "but so many careless or unfair buyers have been making demands for service, repairs, etc., that it has been found necessary to make a charge as a reasonable restriction on such unfair buyers. It is recognized that, if the satisfying of unfair demands is included in the cost of all lathes produced, the fair buyer is unfairly discriminated against and is expected to pay for a service rendered to other people who should pay for the service they themselves exact."

The rate to be charged for service men is to be a matter of individual decision by each lathe manufacturer, the usual charge being $15 a day and expenses. A similar plan may be adopted by other groups of machine tool manufacturers.

The six months' guarantee of each machine sold is restricted to the original purchaser and provides that it is binding only if the machine has been subjected to "normal and proper usage."

Preparing to Build American Passenger Steamers and Motorships

WASHINGTON, June 5.—Taking advantage of the recently enacted Jones-White merchant marine act, Atlantic and Pacific Coast operators are preparing for the construction of fast combination passenger and cargo ships, at a total cost of approximately $66,000,000, according to E. C. Plummer of the Shipping Board. He said he had been informed that three operators on the Pacific Coast and one on the Atlantic are about to make application for loans aggregating $50,000,000 from the construction fund of $250,000,000 carried in the new law.

Pacific operators include the Oceanic Steamship Co., the Oregon Oriental Line and the American Hawaiian Steamship Co. They plan to have at least six ships, and possibly more, built. Under the law, all must be constructed in American shipyards. The Export Steamship Co. already has made application for a loan to build four vessels to be operated between Atlantic and Mediterranean ports.

Mr. Plummer said that the United States lines, which operate the only exclusive passenger service of the 21 Shipping Board lines, are not in a salable condition and that private owners could not, with these vessels, compete successfully with foreign ships. This is because of the slow speed of the American ships in the fleet, with the sole exception of the Leviathan, which has a cruising speed of 23 knots. Mr. Plummer added, however, that when the steamers Monticello and Mount Vernon, which are to be reconditioned and equipped to travel 20 knots, are fitted up, they will be in a position to compete with the finest vessels on the North Atlantic, and could be turned over to private operators with reasonable assurance that the service could be continued, and with the Leviathan would make a balanced fleet of the United States lines.

Electrical Transmission Apparatus Makers Are Merged

The National Metal Molding Co., Pittsburgh, has acquired the American Copper Products Corporation, Bayway, N. J., and the British American Metals Co., Plainfield, N. J., and the three companies have been merged into the National Electric Products Corporation. The companies entering the combination make electrical transmission apparatus, but their products are noncompetitive and the merger is essentially one of companies producing supplementary lines. Control of the Habirshaw Cable & Wire Corporation, with plants at Yonkers, N. Y., and Bridgeport, Conn., is held by the new company.

Officers are W. C. Robinson, chairman; Wylie Brown, president, and I. A. Bennett and H. H. Robinson, vice-presidents. These men and O. F. Felix, C. F. Holdship, A. L. Robinson, A. Jerome, H. C. Carpenter and C. J. Gleason constitute the board of directors.

A. O. Smith Corporation Books Order for 24,000 Tons of 8-In. Pipe

With the beginning of deliveries on an order for 21,000 tons of 16, 18 and 20-in. electrically-welded steel pipe to the Magnolia Gas Co., Latex, Tex., the A. O. Smith Corporation, Milwaukee, announces that it has booked an order for 24,000 tons of 8-in. pipe from the Texas Co. for the transportation of oil. While the Smith company has made welded pipe up to 24 in. in diameter, this is its first order for pipe as small as 8 in. It also is the first time that electrically-welded steel pipe is to be used for transportation of oil. The Magnolia order requires 800 cars, and the Texas order 1000 cars. Shipments are being handled by special trains over the Chicago, Milwaukee, St. Paul & Pacific Railroad.

Hydro-Hoist and Heil Companies Are Consolidated

The Hydro-Hoist Co., Milwaukee, manufacturer of hydraulic hoists, control of which passed several years ago to the Heil Co., Milwaukee, manufacturer of steel dump bodies, tank bodies, tanks and stacks, has now been consolidated with the Heil Co. by an exchange of stock. Capital structure of the Heil Co. has been changed from $200,000 to 75,000 common shares of no par value, and 59,892 shares are now outstanding. The Hydro-Hoist Co. was capitalized at $100,000. Julius P. Heil, founder of the business, and since its organization serving as vice-president and treasurer, as well as general manager, has been elected president and treasurer. Clement C. Smith, formerly president, has been elected chairman of the board. Herman W. Falk, who is president of the Falk Corporation, Milwaukee, is the new vice-president. W. M. Chester has been reelected secretary, and William George Thwaits has been added to the board.

Year Book of American Engineering Standards Committee

An advance copy of the 1928 Year Book of the American Engineering Standards Committee carries a foreword signed by James A. Farrell, chairman of the advisory committee on industrial executives. The book, which is of 88 pages, lists 275 projects which were under way during the year and 111 which have been approved. The general objective of the committee is "to further the development and use of national industrial standards."

Twenty-nine organizations or groups of organizations have representatives on the committee. Sponsors for projects under way include 64 organizations. Trade, technical and governmental bodies cooperating through representatives on committees number 353 and there are 2135 individuals on the various sectional committees. Total receipts during the year aggregated $58,733 and disbursements were $61,267.

May Iron Output Close to April Rate

Daily Production Declined Only 252 Tons or About ¼ of 1 Per Cent from April—Net Gain of Three Furnaces

NET operations of blast furnaces in May changed but little from those in April. Actual data from all furnaces except one show the daily rate last month to have been 105,931 gross tons, as compared with 106,183 tons per day in April, a net loss of only 252 tons per day, or about 0.25 per cent.

Total May production of pig iron was 3,283,856 tons, or 105,931 tons per day for the 31 days. This compares with 3,185,504 tons, or 106,183 tons per day for the 30 days in April. The loss of 0.25 per cent in the May daily rate compares with a gain of 2.9 per cent in April over March. The May output last year was 3,390,940 tons, or 109,385 tons per day—or about 3 per cent larger than May this year.

Net Gain of Three Furnaces

Eight furnaces were blown in and five were shut down during May, a net gain of three. Of the furnaces blown in, five were independent steel company stacks, two were merchant and one is credited to the Steel Corporation. Three merchant furnaces, one Steel Corporation and one independent steel company stack were shut down last month. Most of the net gain for the month was by independent steel companies.

There was no change in the number of possibly active furnaces, which still stands at 343.

Capacity Active on June 1

There were 198 furnaces active on June 1 having an estimated operating rate of 106,145 tons per day, as compared with an operating rate of 104,015 tons per day for the 195 furnaces blowing on May 1. The gain of three furnaces, with a slight loss in daily rate in May as compared with a net loss of two furnaces and a gain in daily rate in April, is largely explained by the irregularity in furnace operations in various months, some being pushed faster than others.

Manganese Alloy Output

Ferromanganese output in May was 29,940 tons, the largest this year and the largest since January,

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1924—Gross Tons

	1924	1925	1926	1927	1928
Jan.	97,384	108,720	106,974	100,123	92,573
Feb.	106,026	114,791	104,408	105,024	100,004
Mar.	111,809	114,975	111,032	112,366	103,215
Apr.	107,781	108,632	115,004	114,074	106,183
May	84,358	94,542	112,304	109,385	105,931
June	67,541	89,115	107,844	102,988	.....
½ year	95,794	105,039	109,660	107,351	.....
July	57,577	85,936	103,978	95,199	.....
Aug.	60,875	87,241	103,241	95,073	.....
Sept.	68,442	90,873	104,543	92,498	.....
Oct.	79,907	97,528	107,553	89,810	.....
Nov.	85,656	100,767	107,890	88,279	.....
Dec.	95,539	104,853	99,712	86,960	.....
Year	85,075	99,735	107,043	99,266	.....

Pig Iron Production by Districts, Gross Tons

	May (31 days)	April (30 days)	March (31 days)	Feb. (29 days)
New York and Mass.	212,333	205,556	216,224	204,744
Lehigh Valley	77,195	81,140	80,058	75,394
Schuylkill Valley	53,162	60,062	51,325	44,861
Lower Susq. and Lebanon Valleys	32,019	31,522	33,301	29,387
Pittsburgh district	700,880	663,784	639,693	597,543
Shenango Valley	114,779	100,073	101,946	90,179
Western Penna.	126,790	116,405	101,365	86,725
Maryland, Virginia and Kentucky	100,508	102,678	103,857	89,803
Wheeling district	124,948	115,284	133,764	118,108
Mahoning Valley	309,842	310,227	296,491	261,837
Central and Northern Ohio	357,900	336,200	330,176	294,427
Southern Ohio	26,380	25,548	25,729	24,772
Illinois and Indiana	694,636	693,271	715,439	639,763
Mich., Minn., Mo., Wis., Colo. and Utah	137,987	134,163	139,101	130,586
Alabama	207,045	199,487	223,314	207,108
Tennessee	7,452	10,104	7,891	4,888
Total	3,283,856	3,185,504	3,199,674	2,900,126

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchants* Iron	Total
May, 1927	84,486	24,899	109,385
June	78,110	24,878	102,988
July	69,778	25,421	95,199
August	71,413	23,660	95,073
September	69,673	22,825	92,498
October	66,991	22,819	89,810
November	64,600	23,679	88,279
December	64,118	22,742	86,960
January, 1928	69,520	23,053	92,573
February	78,444	21,560	100,004
March	83,489	19,726	103,215
April	85,183	21,000	106,183
May	85,576	20,355	105,931

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

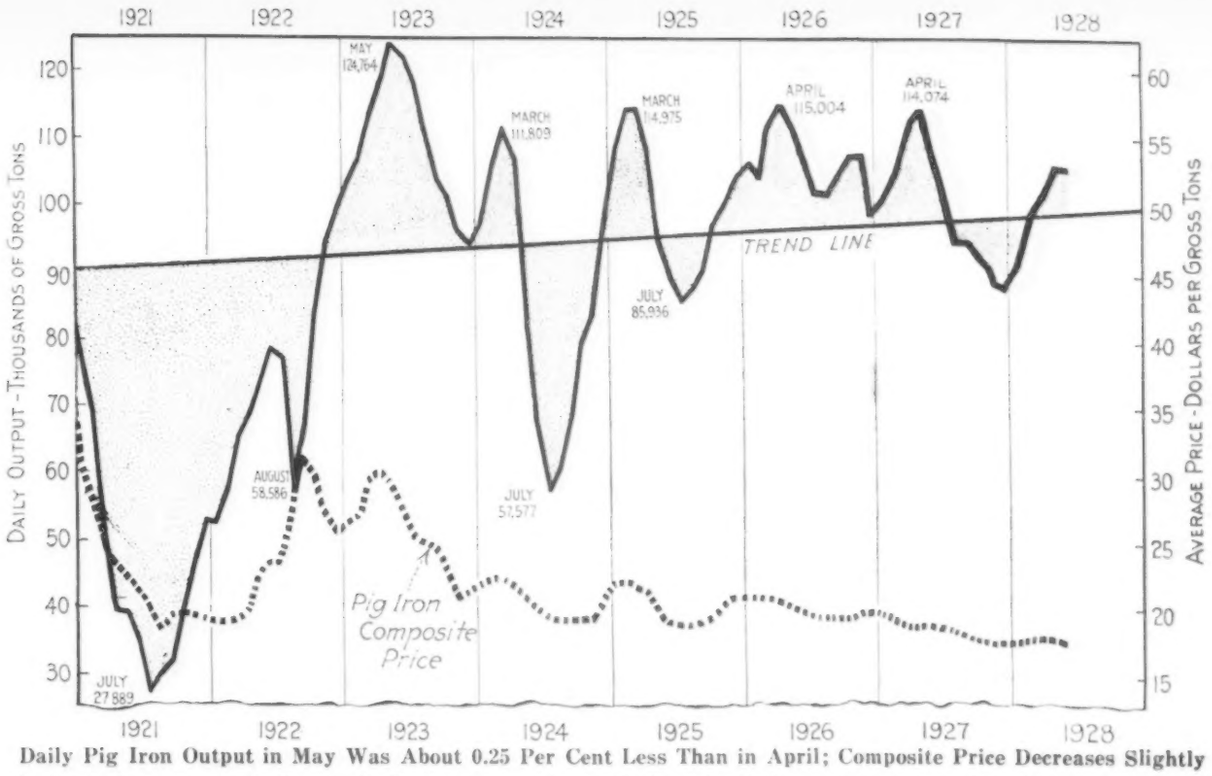
Furnaces	June 1 Number in Blast	June 1 Capacity per Day	May 1 Number in Blast	May 1 Capacity per Day
New York:				
Buffalo	12	5,700	12	5,695
Other N. Y. and Mass.	2	870	3	1,155
New Jersey	0	....	0	....
Pennsylvania:				
Lehigh Valley	5	2,490*	5	2,600*
Schuylkill Valley	4	1,710	4	1,600
Susquehanna Valley	2	1,020	2	980
Ferro. and Spiegel	0	....	1	240
Lebanon Valley	0	....	0	....
Ferromanganese	0	....	0	....
Pittsburgh District	36	22,200	35	21,500
Ferro. and Spiegel	3	530	3	490
Shenango Valley	7	3,700	7	3,550
Western Pennsylvania	6	3,795	7	3,500
Ferromanganese	2	290	1	220
Maryland	5	2,590	5	2,520
Wheeling District	8	4,400	6	3,670
Ohio:				
Mahoning Valley	17	9,735	18	10,410
Central and Northern	19	11,500	18	10,700
Southern	4	1,200	3	850
Illinois and Indiana	33	22,200	34	22,440
Mich., Wis. and Minn.	6	2,680	6	2,565
Colo., Mo. and Utah	4	1,765	4	1,710
The South:				
Virginia	1	230	1	220
Ferromanganese	1	80	0	....
Kentucky	1	345	1	370
Alabama	17	6,775	16	6,600
Ferromanganese	1	100	1	95
Tennessee	2	240	2	335
Total	198	106,145	195	104,015

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months, Beginning Jan. 1, 1926—Gross Tons

	1926	1927	1928
Jan.	3,316,201	3,103,820	2,869,761
Feb.	2,923,415	2,940,679	2,900,126
Mar.	3,441,986	3,483,362	3,199,674
Apr.	3,450,122	3,422,226	3,185,504
May	3,481,428	3,390,940	3,283,856
June	3,235,309	3,089,651	.....
½ year	19,848,461	19,430,678	.....
July	3,223,338	2,951,160	.....
Aug.	3,200,479	2,947,276	.....
Sept.	3,136,293	2,774,949	.....
Oct.	3,334,132	2,784,112	.....
Nov.	3,236,707	2,648,376	.....
Dec.	3,091,060	2,695,755	.....
Year*	39,070,470	36,232,306	.....

*These totals do not include charcoal pig iron. The 1927 production of this iron was 164,569 tons.



Daily Pig Iron Output in May Was About 0.25 Per Cent Less Than in April; Composite Price Decreases Slightly

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. Its position has been revised in the light of the showing of the last few years and shows an average yearly increase in consumption of about 415,000 tons

1927. Two companies made spiegeleisen in May, but the data cannot be published.

Furnaces Blown In and Out

During May the following furnaces were blown in: One Aliquippa furnace of the Jones & Laughlin Steel Corporation in the Pittsburgh district; the Oriskany furnace of the Lavino Furnace Co. in Virginia; one La Belle and one Riverside furnaces of the Wheeling Steel Corporation in the Wheeling district; one River furnace of the Corrigan, McKinney Steel Co. in northern Ohio; the Hamilton furnace of the American Rolling Mill Co. in southwest Ohio; one Gary furnace of the Illinois Steel Co. in the Chicago district, and one Woodward furnace of the Woodward Iron Co. in Alabama.

Furnaces blown out or banked during the month included the following: the Standish furnace in northern New York; the Marietta furnace of the Lavino Furnace Co. in the lower Susquehanna Valley; one Haselton furnace of the Republic Iron & Steel Co. in the Mahoning Valley, and one South Works furnace of the Illinois Steel Co. and one Federal furnace in the Chicago district.

Production of Steel Companies for Own Use—Gross Tons

	Total Iron Spiegel and Ferro		Spiegeleisen and Ferromanganese*			
			1927		1928	
	1927	1928	Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan.	2,343,881	2,155,133	31,844	7,486	22,298	†
Feb.	2,256,651	2,274,880	24,560	7,045	19,320	†
Mar.	2,675,417	2,588,158	27,834	7,650	27,912	†
Apr.	2,637,919	2,555,500	24,735	12,907	18,405	†
May	2,619,078	2,652,872	28,734	9,788	29,940	†
June	2,343,409	.....	29,232	10,535	....	....
½ year	14,876,355	.....	166,939	55,411	....	....
July	2,163,101	.....	26,394	9,350	....	....
Aug.	2,213,815	.....	21,279	9,104	....	....
Sept.	2,090,200	.....	20,675	6,037	....	....
Oct.	2,076,722	.....	17,710	6,129	....	....
Nov.	1,938,043	.....	17,851	6,521	....	....
Dec.	1,987,652	.....	20,992	6,816	....	....
Year	27,345,888	.....	291,840	99,368	....	....

*Includes output of merchant furnaces.
†Data not available for publication.

Large Increase in Exports of Aircraft and Parts

WASHINGTON, June 5.—Aircraft engines, parts and accessories to the value of $815,490 were exported from the United States during the first quarter of 1928, according to the aeronautics section of the transportation division, Department of Commerce. This represents an increase of approximately 250 per cent over the corresponding quarter of last year. The percentage increase for aircraft alone, which includes both airplanes and seaplanes, was much greater than that of the total valuation of aeronautical products exported. There were 49 aircraft, valued at $509,419, exported during the first three months of the present year, compared with five units, valued at $84,576, exported during the corresponding period of 1927.

Peru was the principal market during first quarter of the current year, taking 18 units valued at $120,970. Canada was second, taking nine aircraft valued at $89,670, in addition to an old unit from the war surplus stock. The total value of aircraft parts exported during the first quarter of 1928 was $197,308, more than 130 per cent greater than this class of exports for the first quarter of last year, when the value was $83,310.

Navy Auction Includes Scrap and Machine Tools

An auction of surplus material held at the Navy Yard, New York, and the Naval Supply Depot, Brooklyn, June 5, included about 3500 tons of iron and steel scrap, 400,000 lb. of non-ferrous metals and smaller lots of pipe fittings, boat and ship fittings, electrical material, hardware and hand tools, plumbing equipment and machinery. The machine tools included one 10-in. and two 14-in. turret lathes, belt driven; two monitor lathes; one 7-in. x 3-ft. bench lathe; one 16-in. x 8-ft. engine lathe, motor driven; one 18-in. x 8-ft. engine lathe, belt driven; one 42-in. x 30-in. engine lathe, motor driven; two 18-in. crank shapers; one 12-ft. x 36-in. x 38½-in. bridge planer; one drilling machine, and one hydraulic riveter.

Iron and Steel Markets

Sharp Break in Basic Pig Iron

Valley Iron Drops to Lowest Price Since October, 1915—Gain of Three Active Blast Furnaces in May—Record Steel Production Assured for First Half

THE trend of steel production still is downward, but the rate of recession is gradual and will not prevent the first half of 1928 from establishing a new six-month record by a margin of several hundred thousand tons. While pig iron output has not been on a proportionate scale, falling considerably short of the volume of recent years, the daily rate in May showed a decline of less than ¼ per cent from that of April.

Price developments are featured by a break in basic pig iron in the Valleys from $16 to $15.37 a ton, the lowest price reached since October, 1915. It is too early to ascertain whether this decline will have a sentimental effect on the steel market. In recent years, owing to the increasing integration of steel companies, the influence of merchant pig iron prices on the finished steel market has been of diminishing importance.

The situation in steel prices, meanwhile, is mixed. Most independents have followed the lead of the Carnegie Steel Co. in announcing an advance to 1.90c. per lb., Pittsburgh, on third quarter contracts in plates, shapes and bars, but so far comparatively little business has been done on that basis. The initial effect will probably be to drive in tonnage on second quarter contracts from buyers whose specifications have fallen short of their quotas.

Weakness in sheets has not been checked and there has been another dollar a ton recession in the galvanized and black finishes to 3.50c. and 2.65c. per lb., Pittsburgh, respectively. Tin mill black plate has dropped to a maximum 2.90c., Pittsburgh, with sales reported at 2.80c.

New business in finished steel is light and specifications in many lines are diminishing. Buyers are taking little interest in committing themselves for next quarter, for which several mills have announced prices. Following the advance of $1 a ton on bars, plates and shapes, some makers of hot-rolled strip have indicated a willingness to accept third quarter business at present minimum quotations, while others aim to reestablish the prices originally announced for the current quarter. Prevailing quotations on cold-rolled strips and alloy steel bars have been reaffirmed for next quarter.

Steel mill operations, although receding, are higher than a year ago. In the Pittsburgh district ingot output is a shade below 75 per cent, against 70 per cent 12 months ago. In Chicago a slackening of rail output has caused the general average to decline to 90 per cent, which, however, is 5 to 10 points higher than in early June, 1927.

The automotive industry continues to specify liberally for bars, sheets and strip steel, indicating that motor car output in June will hold up rather well. Forge shops in the Cleveland district are operating at capacity, many of them being filled with work recently placed by the Ford Motor Co.

The expected decline in specifications from the farm implement industry is slow in materializing, according to reports from Chicago, and it is now believed that the interruption of production for inventory taking will be very short.

In the structural steel market political uncertainty is becoming more of a factor as the national conventions draw near. Fabricating awards are light and there is delay in financing new projects. An unusually large amount of work, however, is either up for bids or ready to be released for figuring, New York and Chicago alone accounting for fully 150,000 tons each.

Railroad equipment buying is almost negligible, but an Illinois Central inquiry for 3000 cars is in prospect. Rail orders for the week total 11,000 tons, but rail mill backlogs are on the down grade, as indicated by 85 per cent operations at Chicago, compared with 90 per cent a week ago. The Pennsylvania has entered the market for 12,000 tons of track accessories.

Two steel companies sold the tonnage of basic pig iron which brought a drop of 65c. a ton in the price of that grade in the Valley, a development which emphasizes the growing dominance of the steel industry in merchant pig iron business. In foundry iron there has been some covering for third quarter, but no buying movement of importance has set in. Weakness in pig iron prices extends to foundry, malleable, gray forge and Bessemer in the Pittsburgh and Ohio districts, while efforts to strengthen prices in New England and in the New York district have met with no decided success. Two cast iron pipe producers have bought a total of 15,000 tons of foundry grade from a Virginia furnace at a concession of 50c. a ton.

Pig iron production in May, as computed from returns to THE IRON AGE, averaged 105,931 tons a day, compared with 106,183 tons in April. This was the lowest May rate since 1925. The month showed a gain of three furnaces in blast, following a loss of two stacks in April. The rate of production June 1 for the 198 furnaces in blast was 106,145 tons per day, against 104,015 tons May 1 for the 195 furnaces then active.

Both of THE IRON AGE composite prices have declined. That for pig iron, at $17.23, is at the lowest level since late in 1915. Finished steel is 2.341c., against 2.348c. last week and a low for 1928 of 2.314c. on Jan. 3.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	June 5, 1928	May 28, 1928	May 8, 1928	June 7, 1927
No. 2, fdy., Philadelphia	$20.76	$20.76	$20.76	$21.76
No. 2, Valley furnace	*16.75*	17.00	17.25	18.50
No. 2, Southern, Cin'ti	19.69	19.69	19.19	21.69
No. 2, Birmingham	16.00	16.00	15.50	18.00
No. 2 foundry, Chicago*	18.00	18.00	18.50	20.00
Basic, del'd eastern Pa	19.00	19.00	19.00	20.75
Basic, Valley furnace	*15.35*	16.00	16.50	18.00
Valley Bessemer, del'd P'gh	18.76	18.76	19.26	20.76
Malleable, Chicago*	18.00	18.00	18.50	20.00
Malleable, Valley	*17.00*	17.25	17.25	18.50
Gray forge, Pittsburgh	*18.01*	18.26	18.51	19.76
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	100.00	90.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	33.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	33.50
Forging billets, P'gh	38.00	38.00	38.00	39.00
O.-h. billets, Phila	38.30	38.30	38.30	39.30
Wire rods, Pittsburgh	*42.00*	44.00	44.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.80
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.12
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.85	1.85	1.85	1.85
Steel bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, New York	2.19	2.19	2.19	2.14
Tank plates, Pittsburgh	1.85	1.85	1.85	1.80
Tank plates, Chicago	2.00	2.00	2.00	2.00
Tank plates, New York	2.17½	2.17½	2.17½	2.09
Beams, Pittsburgh	1.85	1.85	1.85	1.80
Beams, Chicago	2.00	2.00	2.00	2.00
Beams, New York	2.14½	2.14½	2.14½	2.09
Steel hoops, Pittsburgh	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	June 5, 1928	May 28, 1928	May 8, 1928	June 7, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	*2.65*	2.70	2.70	3.00
Sheets, black, No. 24, Chicago dist. mill	2.80	2.80	2.85	3.10
Sheets, galv., No. 24, P'gh	*3.50*	3.55	3.60	3.85
Sheets, galv., No. 24, Chicago dist. mill	3.70	3.70	3.70	3.95
Sheets, blue, 9 & 10, P'gh	2.00	2.00	2.00	2.25
Sheets, blue, 9 & 10, Chicago dist. mill	*2.10*	2.15	2.15	2.35
Wire nails, Pittsburgh	2.55	2.55	2.55	2.50
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.55
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.20
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.25
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	*$14.75*	$15.00	$15.50	$15.00
Heavy melting steel, Phila.	13.50	13.50	13.50	14.00
Heavy melting steel, Ch'go	12.75	12.75	13.00	12.00
Carwheels, Chicago	13.25	13.25	13.50	13.50
Carwheels, Philadelphia	15.50	15.50	15.50	15.50
No. 1 cast, Pittsburgh	*14.25*	14.50	14.50	15.50
No. 1 cast, Philadelphia	16.00	16.00	16.00	16.00
No. 1 cast, Ch'go (net ton)	14.00	14.00	14.00	14.50
No. 1 RR. wrot, Phila.	15.00	15.00	15.00	16.00
No. 1 RR. wrot, Ch'go (net)	11.50	11.50	11.50	11.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.60	$2.60	$2.60	$2.90
Foundry coke, prompt	3.75	3.75	3.75	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.87½	14.87½	14.25	12.87½
Electrolytic copper, refinery	14.50	14.50	14.00	12.50
Zinc, St. Louis	6.12½	6.12½	5.95	6.25
Zinc, New York	6.47½	6.47½	6.30	6.60
Lead, St. Louis	**6.17½**	6.07½	6.00	6.10
Lead, New York	**6.30**	6.20	6.10	6.45
Tin (Straits), New York	*49.25*	51.00	51.37½	68.00
Antimony (Asiatic), N. Y.	*10.50*	11.00	11.25	12.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Sharp Break in Basic Pig Iron—May Steel Orders About Equal to April's

PITTSBURGH, June 5.—Weakness in pig iron, with a sharp break in the price of the Valley basic grade, overshadows in interest the steel market this week. Meeting a delivered price of $17.01 on a large tonnage for delivery to Butler, Pa., a Youngstown steel company has driven the furnace base on this grade to $15.35, a drop of 65c. from what has been considered the market price. Not since October, 1915, has the market been that low, and in view of the fact that assembling costs are considerably higher now than then, the present price is being compared with the $13 market in the middle of 1914.

Since there is a relation between the prices of the several grades of iron, the break in basic has unsettled the whole pig iron market, and some other grades have given ground. Foundry and malleable are quotable at 25c. a ton lower.

While steel prices have not for some time been based upon the prices of merchant pig iron, the possible effect of this latest break in iron upon the efforts of steel producers to obtain higher third quarter prices for plates, shapes, bars and other finished products will no doubt be closely watched by consumers.

A check-up of May bookings and shipments of steel in this and nearby districts discloses that in aggregate tonnage the month was well up to the total of April, which is commonly rated as a good month. With the turn of the last month of the first half, there has been a considerable contraction in new buying and in specifications against contracts. Consumers are now ordering only what they must have for immediate use, and future requirements are largely being left for later consideration. There is the suggestion that some large projects are being held up to await the results of this month's Presidential nominating conventions.

Steel ingot production is a shade below 75 per cent of capacity. The gradual character of the recession in steel business is commented upon favorably, and satisfaction is derived from the fact that business is better than it was at this time last year.

Prices are no lower on those products which lately have shown weakness than they have been. Independent companies quite generally are going along with the Carnegie Steel Co. in naming 1.90c., base, on plates, shapes and bars for third quarter. Makers of wire products and strip steel, in opening books for that period, are reaffirming second quarter prices, which are somewhat above what has been commonly realized on shipments lately.

Pig Iron.—Further details of the purchase of basic iron by the American Rolling Mill Co. for delivery to its Butler, Pa., works disclose that instead of a price of approximately $16, Valley furnace, the iron amounting to about 20,000 tons, was sold at $17.01, delivered. Half of the iron was sold by a Youngstown independent steel company, which has a freight rate to Butler of $1.64. This means a furnace price of $15.37. The remainder was sold by a western Pennsylvania steel company, having a freight rate of $1.76 to Butler, resulting in a price

of $15.25 at the furnace. The latter had previously sold a round block of this grade to a Pittsburgh district steel company at $17, delivered, and named the same price on the American Rolling Mill Co.'s inquiry. This price was met by the Youngstown company. Thus the market on Valley basic iron, which long has been in doubt, becomes clearly defined and may be quoted at $15.35. This represents a break of 65c. a ton from what has been regarded as the market price and has unsettled the prices of all other grades. On foundry iron, $17, Valley furnace, for No. 2 grade has become the top instead of the bottom of the market, and no small part of the week's business has been at $16.75. Bessemer still is quoted at $17, but a spread of $1.25 between these grades is exceptional and few expect it to be maintained long. Malleable iron has been sold in small lots at $17.25, but also at $17. Consumers generally do not rate this grade to be worth more than Bessemer iron and formerly it took about the same price as No. 2 foundry. The furnace of the Sharpsville Furnace Co. was blown out June 4.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$15.35 to $15.50
Bessemer	17.00
Gray forge	16.25 to 16.50
No. 2 foundry	16.75 to 17.00
No. 3 foundry	16.25 to 16.50
Malleable	17.00 to 17.25
Low phosphorus, copper free	26.50

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys—Some of the larger users of ferromanganese still are slow about signing last half contracts. They seem to doubt that the recent advance to $105, with freight from Atlantic ports, will hold, but the more plausible explanation, in view of the fact that the price is guaranteed against a decline, is that consumption has been decreasing in keeping with lighter steel works operations, and there is a possibility of a fair-sized carryover of first half material. All of the important users of spiegeleisen are under cover for the last half of the year. Current specifications for this alloy are heavy.

Semi-Finished Steel.—Makers of sheet bars have not had much success in securing third quarter contracts following the effort to stiffen the price. Non-integrated sheet producers, in the absence of signs of improvement in the prices of their products, are disposed to hold off. The open price of $34, Pittsburgh or Youngstown, for sheet bars, has been subject for some time to shading. Large billets and slabs are selling at $33, but the movement reflects the fact that strip steel sales are lighter than they have been. Most of the shipments of wire rods are priced a $42, although the open quotation is $44, base. Pipe skelp is moving fairly steady at unchanged prices.

Bars, Plates and Shapes.—Most of the independent producers have followed the advance recently made by the Carnegie Steel Co. to 1.90c., base Pittsburgh, for third quarter contracts. Some makers have succeeded in getting a very fair amount of third quarter contract business at the new price, but the more general condition is that manufacturers are not pressing for such business and few consumers want to sign up now for that period. The advance appears to apply only on third quarter business, as it is still possible for consumers to place orders for early delivery at 1.85c. May tonnage of these products was little if any behind that of April, which was rated as a good month, but now the demand is governed strictly by known requirements, with future needs being held in abeyance, presumably to await the outcome of the presidential nominating conventions this month.

Rails and Track Supplies.—The local standard-section rail mill is beginning to work on a shorter schedule, as the bulk of the 1928 orders have been completed. New business is light, not only in rails but in track supplies. Light-section rails still suffer in demand from a low rate of soft coal mine operation.

Wire Products.—Several makers have reaffirmed second quarter prices for third quarter contracts, which means $2.65, base, per keg, Pittsburgh, for nails and $2.50, base, per 100 lb., for plain wire. In the quarter now drawing to a close, these prices prevailed on a comparatively small amount of the total shipments, owing to the fact that distributers became heavily stocked through liberal takings on first quarter contracts carrying lower prices, while the movement into consumption was delayed by a backward spring. Some elasticity in connection with low-priced contracts also helped to defeat the effort to secure the prices announced. As the movement into consumption lately has improved, makers are hopeful of better business and also of getting the full quotations.

Tubular Goods.—Standard-weight pipe is moving steadily, but volume still is below normal. No appreciable improvement is noted in the demand from oil and gas producers, nor do pipe makers express much optimism as to the prospect for the remainder of this year. Makers still are waiting for developments in connection with the gas pipe lines that have been so often mentioned since the first of the year. Mill operations are reported as ranging from 60 to 65 per cent, but the rating is against economically workable units rather than against standing productive capacity.

Sheets.—General business is tapering and producers are drawing rather heavily on backlogs. Sheets for metal furniture and refrigerators are doing well in point of demand, but automobile body sheets are moving with less freedom and the common finishes reflect in sales the uncertainty in prices. Blue annealed sheets are fairly firm, and in this immediate area, 2.10c., base, is frequently done, it being necessary to go to 2c. only on strip mill widths.

Tin Plate.—Mill operations remain at 90 per cent or higher. The belief still is that the packing crops will be large, although over much of the country the spring has been two to three weeks late and the crops are that much behind in development. Tin plate specifications are coming along steadily, but container manufacturers are not urging deliveries.

Cold-Finished Steel Bars and Shafting.—Reports that books had been formally opened for third quarter contracts do not refer to producers in this area, who

The Iron Age Composite Prices

Finished Steel

June 5, 1928, 2.341c. a Lb.

One week ago	2.348c.
One month ago	2.348c.
One year ago	2.374c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

June 5, 1928, $17.23 a Gross Ton

One week ago	$17.39
One month ago	17.50
One year ago	19.04
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.75,	Feb. 14;	$17.23,	June 5
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	2.04c. to 2.09c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna	1.95c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.95c. to 2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.75c.
F.o.b. Chicago Heights mill	1.85c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.10c. to 2.15c.
F.o.b. Coatesville	2.00c. to 2.05c.
F.o.b. Sparrows Point	2.00c.
F.o.b. Lackawanna	1.95c.
Del'd New York	2.17½c. to 2.22½c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
F.o.b. Lackawanna	1.95c.
F.o.b. Bethlehem	2.00c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.06c. to 2.18c.
Del'd New York	2.14½c. to 2.19½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh	2.20c. to 2.30c.
From 3 in. to 6 in., P'gh	1.85c. to 2.10c.
6 in. and wider, P'gh	*1.75c. to 1.90c.
Narrower than 3 in., Chicago	2.30c. to 2.40c.
From 3 to 6 in., Chicago	2.10c. to 2.20c.
6 in. and wider, Chicago	2.00c. to 2.10c.
Cotton ties, f.o.b. Atlantic and Gulf ports:	
Carlots per 45-lb. bundle	$1.27
2000 bundle lots	1.25
Larger lots	1.23

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh,	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, up to 18½ in., 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.15c. to 3.30c.
Fender stock, Pittsburgh	4.10c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55 to $2.65
Galvanized nails	4.55 to 4.65
Galvanized staples	3.25 to 3.35
Polished staples	3.00 to 3.10
Cement coated nails	2.55 to 2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. P'gh	2.00c. to 2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill,	2.10c. to 2.20c.
Nos. 9 and 10, del'd Cleveland	2.09c. to 2.19c.
Nos. 9 and 10, del'd Philadelphia	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham	2.20c. to 2.25c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.65c. to 2.75c.
No. 24, f.o.b. Chicago dist. mill	2.80c. to 2.85c.
No. 24, del'd Cleveland	2.79c. to 2.89c.
No. 24, del'd Philadelphia	2.97c. to 3.07c.
No. 24, f.o.b. Birmingham	3.00c. to 3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.85c. to 3.95c.
No. 24, f.o.b. Pittsburgh, B grade	3.65c. to 3.75c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.70c. to 3.75c.
No. 24, del'd Cleveland	3.64c. to 3.69c.
No. 24, del'd Philadelphia	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham	3.80c. to 3.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per package, 20 x 28 in.)

8-lb. coating I.C. $11.20 25-lb. coating I.C. $16.70
15-lb. coating I.C. 14.00 30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30 40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. maker's mill)
Alloy Quality Bar Base, 2.65c.

S.A.E. Series Numbers		Alloy Differential	Net Price 100 Lb. Bars
2000	(½% Nickel)	$0.25	$2.90
2100	(1¼% Nickel)	0.55	3.20
2300	(3½% Nickel)	1.50	4.15
2500	(5% Nickel)	2.25	4.90
3100	Nickel Chromium	0.55	3.20
3200	Nickel Chromium	1.35	4.00
3300	Nickel Chromium	3.80	6.45
3400	Nickel Chromium	3.20	5.85
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50	3.15
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70	3.35
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05	3.70
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35	3.00
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45	3.10
5100	Chromium Spring Steel	0.20	2.85
6100	Chromium Vanadium Bars	1.20	3.85
6100	Chromium Vanadium Spring Steel	0.95	3.60
9250	Silicon Manganese Spring Steel	0.25	2.90
	Chromium Nickel Vanadium	1.50	4.15
	Carbon Vanadium	0.95	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	18
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	18
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1⅝ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

find little interest on the part of consumers for such coverage, and they also want to see how fully the recently announced third quarter price of 1.90c. on hot-rolled bars is maintained. Current business is steady, but individual orders are small and for early shipment. In a general way 2.20c., base Pittsburgh, is well held.

Hot-Rolled Flats. — Several makers have opened books for third quarter contracts and are naming 2.20c. to 2.30c., base, for widths under 3 in., 2.10c. for 3 in. to 6 in., and 1.90c. for 6 in. to 12 in. These are the prices named on second quarter contracts, but they ruled most commonly on the smaller tonnages, since preferred trade had the benefit of some extension of first quarter arrangements. May business with makers in this area was equal to and in some instances in excess of that of the month before. Demand now is lighter.

Cold-Rolled Strips.—A number of makers have reaffirmed second quarter prices for third quarter contracts, quoting 3c., base, for 1 to 3 tons to large users and 3.15c., base, to smaller and more exacting customers. Not much contracting has been done. Current demands are lighter than they were last month, which proved to be almost as good as April.

Bolts, Nuts and Rivets.—Orders and specifications are fairly numerous, but individually are small and volume is well under what it was earlier in the year. Prices are firm and makers are expected to continue present quotations for third quarter contracts.

Warehouse Business.—There have been no changes in the regular warehouse price schedule, but some shading of prices, on the heavier steel items is charged to mill supply houses. Business last month registered a good increase and still is fairly active.

Coke and Coal.—Some furnace coke released through the blowing out of a Valley blast furnace has been absorbed without affecting prices. General production of beehive coke has been scaled pretty closely to actual requirements and the market is fairly steady. Soft coal production is down close to 8,000,000 tons a week, but that fact has brought no real strength to prices. An order for 3000 tons of coking coal per week for an indefinite period, placed by a Cleveland interest whose mine suffered an accident, was readily placed at recent prices. Slack coal is plentiful and weaker.

Old Material.—The market is weak and very dull. A dealer, who is short at one point in the district, has been paying $14.75 to $15 for the better grade of heavy melting steel, but for delivery at other points dealers are covering at as low as $14.25. Railroad lists closing this week will probably go at much under the prices of last month, because the steel companies do not need as much scrap as they did recently and dealers with unfilled orders are not being pressed to ship. The market is weaker on the foundry grades than on the steel works grades. Blast furnace scrap has eased off another 25c. Machine shop turnings are very weak and have been sold at as low as $9, following sales at $9.50. The June list of the Norfolk & Western Railroad offers 8000 tons of scrap.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	$4.39
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, per 100 count	60 per cent off list
Carriage bolts, per 100 count	60 per cent off list
Nuts, all styles, per 100 count	60 per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	$3.00 to 3.10
Wire galvanized soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$14.25 to $15.00
Scrap rails	14.00 to 14.50
Compressed sheet steel	14.50
Bundled sheets, sides and ends	13.50
Cast iron carwheels	14.00 to 14.50
Sheet bar crops, ordinary	15.00 to 15.50
Heavy breakable cast	12.00 to 12.50
No. 2 railroad wrought	14.50 to 15.00
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	9.00 to 9.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	15.50 to 16.00
Railroad coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phosphorus billet and bloom ends	19.00 to 19.50
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	10.50 to 10.75
Short mixed borings and turnings	10.50 to 10.75
Cast iron borings	10.50 to 10.75
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades:	
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	16.50 to 17.00
Cupola Grades:	
No. 1 cast	14.25 to 14.75
Rails 3 ft. and under	15.50 to 16.00
Malleable Grades:	
Railroad	14.25 to 15.00
Industrial	13.75 to 14.50
Agricultural	13.25 to 14.00

FRENCH SCRAP EXPORTS LARGE

Retention of Embargo Urged—Comite des Forges Report Reviews Progress in 1927

PARIS, FRANCE, May 18.—At its annual meeting, May 10, the Comite des Forges de France made public a report on the situation of the French metallurgical trades in 1927. The report describes the successful efforts made last year to increase business and reduce unemployment, which had reached about 80,000 in February. Despite higher prices, in gold, than in 1926, French producers of metallurgical products increased their exports by 1,300,000 tons, from 3,623,000 metric tons in 1926 to 4,921,000 tons in 1927. This was offset slightly by the fact that French consumers used 66 per cent of the total output in 1926 and only 53 per cent last year.

The report points out that world production of pig iron has increased from 78,000,000 tons in 1913 to about 84,000,000 tons in 1927, and that the Russian and Chinese markets are of little consequence at present. Costs, says the report, have been reduced and, as a result, the domestic selling prices in 1927 did not average more than 70 to 80 per cent of the corresponding pre-war market prices.

Considerable attention was given to the high level of French exports of iron and steel scrap, and the report expresses the opinion that the official statistics are lower than the actual exports. It is suggested that nearly as much as is reported to the Government as scrap is being sent abroad under other classifications. "The comparison of French and foreign statistics on scrap exports and imports," says the report, "does not permit of much doubt that this is the case, and this is a point to which we have drawn the attention of the Government, because we have noticed that in some districts and at certain periods of the year, prices of scrap have been rising to high levels. Reduction of our reserves of scrap may have, as regards the national defense in war time, very serious consequences, and this it is our duty to prevent. Therefore, we have followed with anxiety the debates of the international conference for abolition of import and export embargoes held in Geneva in October and November, 1927, in the course of which, at our suggestion, the French Government declared its intention to maintain the present restriction on scrap exports for at least a period of three years."

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	38.00
Forging, guaranteed	43.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00 to $44.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $45. Cleveland mill base, $44.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.85 to $11.00
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.60 to $2.75
Foundry, f.o.b. Connellsville prompt	3.50 to 4.25
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.05
Gas slack, f.o.b. W. Pa. mines	1.10 to 1.15

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$16.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10 to 70
F.o.b. Cleveland	70 and 10 to 70
F.o.b. Chicago	70 and 10 to 70

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Steel Shipments in May Break Record —Operations Decline Slightly

CHICAGO, June 5.—Finished steel shipments from Chicago mills in the month just closed were the heaviest for any May in the history of local production. Output in the first five months of this year is well ahead of a year ago at this time and orders now on the books indicate that steel mill shipments during the first half of 1928 will be measurably ahead of the first six months of last year.

A reduction of about five points in the rate of rail mill production accounts for a slowing of ingot output to 90 per cent of capacity. Although close to 11,000 tons of rails were purchased in the week, a further downward revision in rolling schedules is to be expected.

Local producers have not officially opened books for third quarter. Purchases by miscellaneous users bulk large, the total for the week being the best in the last five. Official announcements of third quarter prices are being withheld for the time being, though it is commonly believed that 2c., Chicago, will be named on plates, shapes and bars. If there is a tendency one way or the other in the matter of price levels, it is a leaning toward the firmer side, though concessions are still to be had on attractive business and where the steel desired fits advantageously into rolling schedules.

The Omaha lines of the Chicago & North Western have ordered 200 flat cars and will buy 250 stock cars. The Rock Island will purchase 250 gondola car bodies. The trade expects the Illinois Central to enter the market for about 3000 cars in the next 60 days.

Pig Iron.—Shipments of Northern pig iron from local furnaces in May fell short of the total in April, but this situation is looked upon by the trade simply as evidence of the nearness of an expected slowing down in the summer months. Looking back over the first five months of this year, the picture is more encouraging because in that period release orders were fully 20 per cent heavier than in the corresponding months of 1927. A 6000-ton inquiry for Northern iron is still open in Michigan. New buying is slowing down. Southern iron is selling at $16, Birmingham, or $22.01, delivered all-rail to Chicago.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.50
Malleable, not over 2.25 sil.	18.00
High phosphorus	18.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	21.51
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—It is not uncommon to find dissatisfaction among buyers over the advance in the price of ferromanganese, and it is somewhat doubtful whether third quarter coverage has been as widespread or as heavy as might reasonably be expected. Several carloads of 19 to 21 per cent spiegeleisen have been sold at $32, Hazard, Pa., and two small inquiries are before the trade. There is little interest in new buying of ferrosilicon, but specifications for this commodity are in good volume.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $37.76 to $39.76.

Plates.—In the past 10 days new orders and specifications for plate mill products have been in larger volume. Ordering out of tankage materials has been steady, and in addition the general manufacturing trade has been purchasing liberally and asking for early delivery on such tonnage as is required to piece out the remainder of the second quarter. Not taking into account wide sizes, local mills are engaged at close to capacity, and it is significant that the universal and sheared commodities are about balanced as to shipments. Prices on the bulk of going business remain at 2c. per lb., Chicago, although 1.95c. is heard of locally and still lower quotations are being made for delivery into the Southwest. Orders for oil storage tanks total 2500 tons and fresh projects will take 1500 tons. Of 112 passenger cars recently placed by Eastern and Western railroads, not less than 99 will be constructed in shops that are tributary to Chicago mills, which will benefit to the extent of 1500 tons of steel. New business in cars is small and fresh inquiry is stagnant. The Illinois Central will take figures on two 20-ton air dump cars and the Omaha lines of the Chicago & North Western will open bids June 8 on 250 stock cars.

Mill prices on plates per lb.: 2.00c., base Chicago.

Structural Material.—From the viewpoint of sales, this market is the dullest in weeks, but this situation affords time for fabricators to busy themselves in preparing estimates on new projects that have recently come out. Shops, for the most part, are well supplied with work and fabricating schedules are better balanced as to large and small tonnage orders than in many months. In some cases orders have been taken that cannot be executed on the delivery schedules demanded and a fair tonnage in structural projects has been farmed out to shops other than those operated by the successful bidders. The report is that the upper floors of the Mercantile Mart will be constructed of reinforced concrete. The Agricultural Mart, once reported as requiring close to 80,000 tons, is now in new hands and there is some probability that the project may again go forward. The Petroleum Iron Works has taken 1700 tons for a theater at San Antonio, Tex. New bids are being taken on the South Bend, Ind., station of the New York Central. Interest among fresh inquiries is 1000 tons for a highway bridge at Manistee, Mich.

Mill prices on plain material per lb.: 2.00c., base, Chicago.

Bolts, Nuts and Rivets.—Producers are submitting contracts for the third quarter at the prices which have held for several months. Specifications from practically all sources are lighter, though as yet output has been changed only slightly. Heavier release orders from manufacturers of farm implements are expected soon after June 15.

Reinforcing Bars.—Orders for this commodity are numerous, and though users' requirements are usually in small lots, the aggregate tonnage is of good size. Shop operations are being maintained at 80 per cent of capacity. Specifications are large against orders placed earlier in the spring, and benders are having some difficulty in maintaining delivery schedules. Dry weather and moderate temperatures have contributed to extra speed in building construction throughout most of the Central West. Illinois State road programs are well under way, and heavy shipments of hard steel bars are going forward to contractors. Prices for billet and rail steel reinforcing bars are steady. Recent awards and new inquiry are shown on page 1648.

Cold-Rolled Strip.—Demand for this commodity is undiminished and shipments represent close to capacity output at mills. Although some readjustment is reported in automobile manufacture, it is not yet noticeable in specifications from that source for cold-rolled strip. Chicago delivered prices for all widths up to and including 18½ in. are steady at 3.30c. to 3.45c., in 1 to 3-ton lots.

Bars.—Bar mill products are still in heavy demand and again this week, as was the case the week before, new orders are equal to shipments. Diversity of consumer demand is a feature of this market, as is also the steadiness with which automobile manufacturers and parts makers continue to take steel, notwithstanding reports of some curtailment in automobile production. The expected drop in specifications from farm implement plants has not materialized to any great degree, and it now appears that the inventory period in that industry will be passed with an extremely short halt in production. Most of the new sales of mild steel bars are at 2c., Chicago. Individual orders are not large and indicate caution on the part of consumers,

who are closely watching tendencies in prices. Although no official announcement has been made concerning third quarter prices, there is little doubt in buyers' minds that producers will now book in advance at current price levels. Specifications for iron bars are in small volume. Producers have opened books for the third quarter at 2c., Chicago, which is the price that has been maintained throughout the present quarter. Purchasers have not yet shown interest in midsummer requirements. Specifications for alloy steel bars are taxing local mills to capacity production, though deliveries are somewhat better now than in late May. Some producers have opened books for the third quarter. Prices are steady. Quotations on rail steel bars are strong at 1.85c., Chicago Heights. It is not improbable that the spread of $3 a ton between prices of hard steel and billet stock bars will be reduced to $2 if the makers of soft steel bars succeed in holding third quarter prices at 2c. per lb., Chicago. Specifications for hard steel bars are steady and afford continuance of double-turn operations at both local mills. New buying is lagging only a trifle behind shipments.

Mill prices per lb.: Soft steel bars, 2.00c., base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

Wire Products.—Demand for wire and wire products is steady for this time of the year. Jobbers, particularly to the west, are taking out larger quantities and shipments to the manufacturing trade are undiminished. There is evidence of unsettling in prices for plain wire in the Northwest and at St. Louis. Shipments of wire nails are in small volume, and with mill stocks well balanced, production is at low ebb, in some instances being not above 30 per cent of capacity. Crop reports throughout the Middle West are more encouraging. The season is less backward than it appeared in May. Rains over much of the Mississippi River territory have materially improved conditions.

Rails and Track Supplies.—Two railroads, one operating east and the other west from Chicago, have closed for a total of 11,000 tons of standard-section rails. New business in track supplies is for fully 5000 tons. Specifications for track fastenings this week were the largest in many months. The Pennsylvania Railroad is inquiring for 12,000 tons of track accessories, about half of which is expected to come to Chicago mills. The bulk of the rail rolling schedule is now past and production at Chicago district mills has been reduced to 85 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Sheets.—This market is drifting. Hot mills are engaged at 60 per cent of capacity. Fresh orders are in unusually small lots and from a narrowing circle of users, who are experiencing a seasonal drop in their business and who appear to be well convinced that this is not the time to make heavy purchases. Prices for black sheets are weak, and as low as 2.80c., Chicago, has been done. Recent sales of black and galvanized sheets show that the spread between maximum and minimum prices has been narrowed to $1 a ton. Notwithstanding that total orders to mills are small, there is an insistent demand in the immediate Chicago territory for blue annealed sheets by manufacturers of furnaces, tanks, lockers, road strips and farm machinery.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 2.85c. to 2.90c.; No. 24 galvanized, 3.75c. to 3.80c.; No. 10 blue annealed, 2.20c. to 2.30c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Cast Iron Pipe.—A feature of this market is the sudden activity on the part of contractors, who have taken not less than 5000 tons of cast iron pipe in the last seven days. Public lettings have not been large, but fresh inquiry is promising. Chicago will open bids June 11 on 1600 tons of 6 and 8-in. class B pipe. Jackson, Mich., and Cynthiana, Ind., are in the market for small tonnages. At Toledo, Ohio, an unnamed bidder secured a fair-sized order at a price somewhat better than $32, Birmingham. The railroads and public utilities are again in the market for miscellaneous current requirements.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $40.20 to $41.20; 4-in., $44.20 to $45.20; Class A and gas pipe, $4 extra.

Coke.—Demand is steady and prices are firm. All Chicago by-product ovens are lighted.

Old Material.—Tendencies in the local scrap market are mixed. Prices for some specialties are steady under the influence of moderate buying by melters, who hesitate to carry stocks and who are finding business moderately good. Cast iron borings have sold off 25c. during the week and 1000 tons of hydraulic compressed sheets have been taken by a user at 25c. above last week's price. Five large lists prepared by Eastern railroads have been offered to dealers. Local scrap yards are not carrying heavy stocks, but they are being operated rather actively.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.75 to $13.25
Shoveling steel	12.75 to 13.25
Frogs, switches and guards, cut apart, and miscellaneous rails	13.50 to 14.00
Hydraulic compressed sheets	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
Forged, cast and rolled steel carwheels	15.75 to 16.25
Railroad tires, charging box size	16.50 to 17.00
Railroad leaf springs, cut apart	16.50 to 17.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.50 to 15.00
Coil springs	17.00 to 17.50
Electric Furnace Grades:	
Axle turnings	13.00 to 13.50
Low phosphorus punchings	14.25 to 14.75
Low phosphorus plate, 12 in. and under	14.25 to 14.75
Blast Furnace Grades:	
Axle turnings	10.00 to 10.50
Cast iron borings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
Machine shop turnings	7.25 to 7.75
Rolling Mill Grades:	
Iron rails	14.00 to 14.50
Rerolling rails	15.00 to 15.50
Cupola Grades:	
Steel rails less than 3 ft	15.50 to 16.00
Angle bars, steel	14.50 to 15.00
Cast iron carwheels	13.25 to 13.75
Malleable Grades:	
Railroad	13.00 to 13.50
Agricultural	12.00 to 12.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angles and splice bars	14.25 to 14.75
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	23.00 to 23.50
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	11.25 to 11.75
No. 1 busheling	10.00 to 10.50
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	12.00 to 12.50
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.00 to 14.50
No. 1 railroad cast	13.00 to 13.50
No. 1 agricultural cast	12.50 to 13.00
Stove plate	11.25 to 11.75
Grate bars	11.25 to 11.75
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.30c. to 3.00c.
Reinforcing bars, hard steel	2.00c. to 2.70c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire per 100 lb	$3.30
Common wire nails base per keg	3.10
Cement coated nails, base per keg	3.10

Philadelphia

Shapes and Sheets Still Weak—Bar and Plate Prices Maintained

PHILADELPHIA, June 5.—Since the leading interest has reaffirmed 1.90c. per lb., Pittsburgh, for plates, shapes and bars for third quarter contracts, bar and plate mills have adopted a slightly firmer attitude. Consumers show no inclination to enter into third quarter commitments and sellers are not pressing for contracts.

The eastern Pennsylvania market on shapes is unchanged, despite the firmer position taken on bar and plate prices. Shapes are still quoted at 2c., Pencoyd, and Bethlehem, Pa., and these prices are shaded occasionally on desirable tonnages. Operating rates of eastern Pennsylvania mills have receded slightly from the schedules of the earlier months of the year, but are still at a fairly high level in most cases.

Blue annealed sheet prices have developed a wide spread as a result of the determined stand of eastern Pennsylvania producers, who are endeavoring to maintain 2.10c., Pittsburgh. Blue annealed sheet mills are quoting 2c. to 2.10c. per lb., Pittsburgh, and producers of continuous mill sheets have sold 1.90c. to 2c., Pittsburgh. Galvanized sheets are only moderately firm at 3.50c., Pittsburgh, but small lots bring up to 3.60c.

Pig Iron.—No contracts of size have been closed for third quarter delivery. The foundry iron price continues at $20, base furnace. The American Engineering Co., Philadelphia, has been buying No. 1X iron in 100-ton lots and in the past fortnight has placed 200 tons or more with eastern Pennsylvania producers. The Sun Shipbuilding & Dry Dock Co., Chester, Pa., is in the market for a small tonnage of foundry iron. The Virginia furnace interest has sold 15,000 tons of foundry iron to two Virginia cast iron pipe makers, 10,000 tons to the Lynchburg Foundry Co. and 5000 tons of the Glamorgan Pipe & Foundry Co. The Birmingham price was met by a concession of 50c. a ton from the $20 base. On carload lots $20 is now being quoted. The demand for low phosphorus iron is quiet.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76
East. Pa. No. 2X 2.25 to 2.75 sil.	21.26
East. Pa. No. 1X	21.76
Basic (delivered eastern Pa.)	$19.00 to 19.50
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain 1.75 to 2.25 sil.	24.54
Virginia, No. 2X 2.25 to 2.75 sil.	25.04

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, ⅜-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.35c.
Cold-finished steel, squares and flats	3.85c.
Steel hoops	3.50c.
Steel bands, No. 12 gage to ⅜-in., inclusive	3.25c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.00c.
†Galvanized sheets (No. 24)	4.75c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bundles, 4.25c. base; 1 to 9 bundles, 4.50c. base.
†For 50 bundles or more; 10 to 49 bundles, 5.10c. base; 1 to 9 bundles, 5.45c. base.

Bars.—Most sellers are endeavoring to reestablish 1.90c. per lb., Pittsburgh, or 2.22c., delivered Philadelphia, as the third quarter contract price, but consumers show no inclination to enter into future commitments. Orders for prompt shipment are small, and on such business quotations range from 1.85c. to 1.90c., Pittsburgh, or 2.17c. to 2.22c., Philadelphia. Consumers who have been using foreign steel are reported as buyers of small lots of domestic bars, the price of foreign steel being too high at present to offer much of a saving.

Shapes.—Despite the reaffirmation of 1.90c., Pittsburgh, last week as a current and third quarter contract price, the eastern Pennsylvania market is unaffected and still ranges from 2c., Pencoyd, or 2.06c., Philadelphia, to 2c., Bethlehem, or 2.13c., Philadelphia. There are a number of local building projects that will require fair tonnages of steel, but in general the market is inactive and competition is keen.

Plates.—Eastern Pennsylvania producers are quoting 2c. to 2.05c., Coatesville, which, with occasional exceptions on the more desirable current business, has been the range on new business since the beginning of the quarter. With 2.05c., Coatesville, as the third quarter contract price, buyers are not showing much interest in future requirements.

Ferromanganese.—Contracts for third quarter and second half delivery are still confined to the smaller consumers and seldom exceed 200 or 300 tons. Prices are reported firm at $105 per ton, seaboard.

Sheets.—Eastern Pennsylvania producers of blue annealed sheets are still seeking 2.10c., Pittsburgh, on current orders, but the market ranges from 2c. to 2.10c., Pittsburgh, or 2.32c., to 2.42c., Philadelphia, with the lower price prevailing on all but the smallest lots. Occasional sales have been made ignoring the 25c. extra for deep drawing material. Continuous mill sheets are being sold at 1.90c. to 2c. per lb., Pittsburgh, or 2.22c. to 2.32c., Philadelphia. Automobile body builders and other consumers in this market are moderately busy. Black sheets are quiet, and prices range from 2.60c. to 2.65c. per lb. Galvanized sheets are quoted from 3.50c. to 3.60c. per lb., Pittsburgh.

Old Material.—With a plentiful supply of scrap and in the absence of any substantial buying, prices still show a tendency toward weakness. Shipments of No. 1 heavy melting steel are principally to plants at Bethlehem and Steelton, Pa. A Phoenixville mill is paying $10.50 per ton for machine shop turnings, but has not bought a substantial tonnage. Blast furnace scrap is going to Swedeland and Steelton, Pa., on $10.50 per ton contracts. Couplers and knuckles and rolled steel wheels have recently sold at $15 per ton, delivered eastern Pennsylvania.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	14.50 to 15.00
Bundled sheets (for steel works)	10.50
Machine shop turnings (for steel works)	10.50 to 10.75
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	10.50
Heavy breakable cast (for steel works)	15.50 to 15.75
Railroad grate bars	11.50
Stove plate (for steel works)	11.50
No. 1 low phos., heavy, 0.04 per cent and under	17.50 to 18.00
Couplers and knuckles	15.00 to 15.50
Rolled steel wheels	15.00
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	11.00 to 11.25
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to 12.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	14.50 to 15.00
Steel rails for rolling	14.75 to 15.25

Warehouse Business.—May sales were slightly larger than the April volume of business, but orders are small, seldom exceeding one or two tons of material. Prices are unchanged and the quantity differentials are apparently being maintained by jobbers.

Imports.—In the week ended June 2, 1140 tons of ore arrived at this port, 640 tons of chrome ore from

Portuguese Africa and 500 tons of manganese ore from India. Pig iron arrivals totaled 2301 tons from the United Kingdom and 1400 tons of ferromanganese from the same source. Steel arrivals consisted of 554 tons of shapes, 23 tons of steel bands, 5 tons of bars and 319 tons of steel skelp from Belgium and 469 tons of steel slabs and 500 tons of steel bars from France.

New York

Pig Iron Sales Increase—16,000 Tons of Steel Let for Building

NEW YORK, June 5.—Pig iron sales in this district, at over 12,000 tons, showed a gain of 5000 tons over the total for the previous week. There were few outstanding purchases; in fact, individual sales were rather small on the average and in many instances June delivery of part of the iron was asked for, indicating that melters' stocks are low. Foundry operations are spotty but, on the whole, appear to be holding at an unchanged rate. The Foran Foundry & Mfg. Co., Flemington, N. J., has closed for 1500 tons. The Ingersoll-Rand Co., New York, has bought 1000 tons of malleable for Phillipsburg, N. J., and 750 tons of malleable and 250 tons of foundry iron for Painted Post, N. Y. It is still in the market for 1000 tons of iron for delivery during the remainder of the year. The General Electric Co. has issued inquiries for 700 tons of No. 2X and No. 1X for Bayway, N. J., and 1100 tons of No. 2 plain and No. 1X for its New England plants. It also wants several hundred tons for Elmira, N. Y., and Erie, Pa., and is still in the market for 400 tons of No. 2X for Schenectady, N. Y. The Richmond Radiator Co., New York, has not yet closed on its inquiry for 5000 tons for Uniontown, Pa. Buffalo producers are trying to obtain a minimum of $16.50, base furnace, on foundry iron and have succeeded in making some small sales at that figure. Eastern Pennsylvania makers continue to quote $20, base furnace. The Standish, N. Y., furnace, maker of copper-free low phosphorus iron, was blown out May 31.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	20.89 to 23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 23.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Finished Steel.—Viewed by the tonnage booked and shipped in May, steel business in the New York district left little to be desired, but in the last week the tapering off in buying, both as regards contract specifications and new orders, has been marked. In some products, notably sheets, strip steel and hot-rolled bars, there are clear indications of lessened requirements. Some consumers did not fully specify their May quotas on contracts. Jobbers are taking in a fairly good tonnage of pipe to replace that going out on building jobs, and in tin plate there is a satisfactory degree of activity, but elsewhere the market has its dull spots. In structural steel, recent lettings have not been large, but the outlook for the summer continues bright, considering that a total of close to 150,000 tons is in the market or will be shortly. Steel for the Lincoln Building to be built on East Forty-second Street, requiring 16,000 tons, has been awarded, and the award of 10,000 tons for the New Yorker Hotel may come within a week or two. Local fabricators of steel pipe are figuring on 3500 tons of steel required for pipe, on which the borough of Brooklyn last week received general contract bids. A pipe job in the Bronx, amounting to 1300 tons of steel, has been awarded to the East Jersey Pipe Co. The announcement of the leading steel interest of a third quarter contract price of 1.90c., Pittsburgh, on plates, shapes and bars, though followed by some of the independent steel companies, has caused scarcely a ripple in this market. Its effect may be to stimulate specifications before the end of this month on 1.85c. second quarter contracts, but few, if any, third quarter commitments have been entered into. On current business the chief price developments are on sheets. Galvanized sheets have weakened further, so that 3.50c., Pittsburgh, is now the usual quotation to jobbers, and other trade is being asked to pay 3.55c. Black sheets have been sold at 2.65c., though 2.70c. is the more common price on the small lots that are being bought. Blue annealed remain at 2c. to 2.10c.

Mill prices per lb., delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; structural shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

Warehouse Business.—Small lots of structural steel are in demand and there is some activity in galvanized sheets. Sheet prices are still being shaded by $1 to $2 a ton, but not on all gages, as jobbers offering such concessions apparently do not always have complete stocks. The recently adopted quantity differentials are being generally applied on warehouse purchases in this district and consumers are beginning to take advantage

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars and small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-rolled strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue annealed sheets (No. 10 gage)	3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8 in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.20c.
No. 18	4.35c.
No. 20	4.50c.
No. 22	4.55c.
No. 24	4.70c.
No. 26	4.95c.
No. 28*	5.20c.
No. 30	5.60c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

of the reductions in price for larger quantities by waiting to accumulate larger orders than in the past.

Cast Iron Pipe.—Prices are unchanged, with Northern makers of pressure pipe quoting delivered prices of $37.60 to $38.60, base, and Southern foundries quoting $32 to $33, Birmingham. Interest of consumers in centrifugally cast pipe continues to increase, and on the basis of recent sales the price per foot is slightly less than that for sand cast pipe. The low bidder for a contract in Raritan Township, N. J., requiring about 3000 tons of 4 to 16-in. water pipe, was W. G. Fritz, West Orange, N. J. The Department of Purchase, New York, opens bids June 8 on a small tonnage of special castings. Wethersfield, Conn., has been taking bids on about 320 tons of 10-in. pipe. A recent inquiry from a company in New York for water pipe to be delivered to Los Angeles, Cal., specifies 36,000 ft. of 4-in., 10,000 ft. of 8-in. and 14,000 ft. of 20-in. pipe.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $37.60 to $38.60; 4-in. and 5-in., $42.60 to $43.60; 3-in., $52.60 to $53.60; Class A and gas pipe, $4 to $5 extra.

Reinforcing Bars.—A large volume of road work has been closed recently and the tonnage involved in small miscellaneous projects seems to be increasing. New business continues to come out at a fair rate and there is promise of considerable activity during the summer months. The general contract has not yet been let on the proposed building for the New York Dock Co. in Brooklyn, which will require approximately 2500 tons, and bids will be taken this week on a post office at Long Island City, involving about 275 tons, and on a printing building at Greenwich, Conn., requiring 250 tons. Competition with foreign steel is increasingly keen, but price advances by European mills seem to indicate a falling off in the volume of imported bars. On the general run of business 2c., Pittsburgh, is generally adhered to, but on large jobs concessions of $1 and occasionally $2 a ton are not infrequent. The Youngstown warehouse price is unchanged at 2.20c., or 2.57½c., on cars at New York, and out of New York warehouses distributers are quoting 2.80c. for lots of 5 tons or more, 2.95c. for lots of 2 to 5 tons and 3.24c. for less than 2 tons, all delivered at job.

Coke.—Most consumers have covered their requirements for the third quarter on both furnace and foundry coke. Standard furnace coke is being quoted at $2.75 per net ton, Connellsville. Special brands of foundry coke are $4.85 per ton at the ovens and delivered prices are: To northern New Jersey, Jersey City and Newark, $8.56 per net ton; to New York and Brooklyn, $9.44 per net ton. By-product foundry coke ranges from $9 to $9.40 per net ton, Newark or Jersey City, and from $10.06 to $10.29 per net ton, New York or Brooklyn.

Old Material.—Buying prices of No. 1 heavy melting steel, delivered to Bethlehem, Pa., have been reduced to $13 per ton and blast furnace material is now quoted by dealers at $9.50 per ton, delivered to Bethlehem or Swedeland, Pa. Machine shop turnings are quoted at $10 to $10.50 per ton, delivered. An auction sale of surplus material at the Brooklyn Navy Yard held today included about 3500 gross tons of iron and steel scrap and a small tonnage of non-ferrous metals. In addition, material at Lake Denmark, Dover, N. J., was offered, consisting of 956 tons of damaged structural steel and about 200 tons of shell steel.

Dealers' buying prices per gross ton f.o.b. New York:

No. 1 heavy melting steel	$10.00 to $10.35
Heavy melting steel (yard)	6.75 to 7.25
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	7.25 to 7.50
Locomotive grate bars	7.50 to 8.00
Machine shop turnings	6.25 to 6.75
Short shoveling turnings	6.25 to 6.75
Cast borings (blast furnace or steel works)	6.25 to 6.75
Mixed borings and turnings	6.25 to 6.75
Steel car axles	15.00 to 15.50
Iron car axles	23.75 to 24.75
Iron and steel pipe (1 in. dia., not under 2 ft. long)	8.25 to 8.75
Forge fire	6.50 to 6.75
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought long	8.50 to 9.00
Rails for rolling	10.00 to 10.50
Cast iron carwheels	11.00 to 11.50
Stove plate (foundry)	8.50 to 9.00
Malleable cast (railroad)	10.00
Cast borings (chemical)	10.75 to 11.25

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$13.50 to $14.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	11.50 to 12.00
No. 2 cast (radiators, cast boilers, etc.)	11.00 to 11.50

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.56c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.85
No. 9 galvanized wire, per 100 lb	3.30
Common wire nails, base per keg	2.85

*Net base, including boxing and cutting to length.

Cleveland

Mill Books Open for Third Quarter But Consumers Are Slow to Contract

CLEVELAND, June 5.—Most of the independent mills have followed the leading interest in a $1 a ton advance on steel bars, plates and structural material to 1.90c., Pittsburgh, for the third quarter, and others are expected to fall in line. Local mills will advance steel bars to 1.90c., Cleveland, if the Pittsburgh advance is maintained. Few consumers are taking any interest in the third quarter, and it may be two weeks or more before the new price is well tested. One or two consumers have made unsuccessful attempts to add additional tonnage to their second quarter contracts at 1.85c. and have them extended through the third quarter. However, as the latter price is still in effect for current business, buyers can place orders at that price for deliveries that might extend into July. The price advance is expected to drive in considerable tonnage on second quarter contracts, as quite a few consumers have been falling behind on specifications against these contracts.

Steel bar bookings held up well through May, but orders for structural material and plates fell off. Specifications for these products have been moderate the past week and new business was very light. Good specifications for steel bars are coming from forge shops in this territory that are all operating at full capacity, many of them being filled up with work recently placed by the Ford Motor Co. Good specifications also for sheets and hot and cold-rolled strip have come from the automotive industry for June, indicating that production by that industry will hold up quite well this month. However, with the expected general slowing down of the demand from this source, makers of these products see little chance for getting better prices for the next quarter.

Some of the strip steel manufacturers are willing to take contracts for the third quarter at present prices and some of the sheet mills are ready to take more business for that delivery if they can get somewhat better prices than the minimum quotations now prevailing. The reaffirming of alloy steel bar prices for the third quarter has not yet resulted in any buying for that delivery.

In the structural field considerable inquiry is coming out for small lots, but little work of any size is pending. Lake shipyards have received an inquiry for a boat requiring 1500 tons of steel. Mount Clemens, Mich., has placed a contract for a steel intake pipe for its waterworks department, requiring 350 tons of plates, which will be supplied by the Biggs Boiler Works.

Pig Iron.—Sales of foundry and malleable iron continue in fair volume, although no large tonnages are being placed. Cleveland interests during the week sold 22,000 tons, mostly in small lots covering June

shipment and the third quarter. As large consumers in the automotive and other industries are not yet showing much interest in third quarter contracts, an active buying movement is not in immediate prospect. One round-lot purchase made recently by an Indiana melter was for the entire last half, but with that exception sales have been restricted to the third quarter. Prices are steady at the recent levels, with a general range by Cleveland furnaces of $16.25 to $16.50 on foundry and malleable iron for business in competitive territories, although a little tonnage has been taken at $17 for delivery in this immediate territory. For Cleveland delivery, local furnaces are holding to $18, furnace, but a small amount of business for Cleveland shipment has been taken by an outside producer at a delivered price that figures a few cents a ton lower than the local delivered price. In Michigan the price range is unchanged at $17.50 to $18, furnace. The 6000 tons of malleable iron inquired for by a Benton Harbor, Mich., consumer, on which a Cleveland producer figured, will probably be supplied by a Chicago furnace. It has developed that the basic iron recently purchased for a Butler, Pa., plant was bought at $17, delivered, a large block of it being placed with a Mahoning Valley furnace, the furnace price being $15.37. This indicates a further 50c. decline on basic, the Valley basic price no longer being above $15.50. An Ohio steel maker will purchase 10,000 tons of basic this month. Pig iron shipments by Cleveland interests in May held up to the April volume and June shipping orders are starting out well.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	$21.50 to 22.00
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	15.35 to 15.50
Standard low phos., Valley furn'ce	26.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Iron Ore.—The late start in Lake navigation is reflected in the figures showing the water movement of iron ore for the first two months of the season. The total movement to June 1 was 5,368,761 tons, a decrease of 3,943,796 tons or 42.35 per cent, compared with the corresponding period last year. The May movement was 5,362,815 tons, a decrease of 2,389,656 tons, compared with May last year. The ore market is virtually at a standstill.

Coke.—A moderate amount of activity has developed in contracts for Connellsville foundry coke for the third quarter and some of the foundries are combining orders for their June requirements with these contracts, having already taken all the coke covered by their second quarter contracts. Prices are unchanged at $3.50 to $4.85 for standard Connellsville foundry coke and $7.75, Painesville, for June shipment of Ohio by-product foundry coke.

Semi-Finished Steel.—A sheet mill in the Central Western district has purchased 22,000 tons of sheet bars for the third quarter from a Cleveland maker subject to the price that is eventually established. Some non-integrated producers are urging the naming of third quarter prices, but producers are holding off. Specifications are keeping up to the recent good volume against $33, Cleveland, contracts for sheet bars, billets and slabs.

Bolts, Nuts and Rivets.—Present discounts on bolts and nuts will probably be reaffirmed for the third quarter, as some of the bolt and nut manufacturers plan to open their books late this week for contracts for the next quarter at the prevailing discounts. Orders are keeping up in fair volume. The demand for rivets is still slow.

Sheets.—Mills having contracts with automobile manufacturers have received liberal specifications for June shipment, but otherwise the demand in this territory is light. The market continues weak and irregular. Blue annealed sheets are rather freely offered at 1.90c., Pittsburgh, and some of the mills are waiving the 10c. extra for 40-in. and wider material. However, one important producer is refusing to shade 2.10c. Black sheets are available at 2.65c., Pittsburgh. Galvanized sheets are quoted at 3.50c., Pittsburgh and Valley. Shading to 2.80c., Pittsburgh, is reported on tin mill black plate. Some consumers are willing to place third quarter contracts at present minimum prices, but mills are unwilling to go that low for contracts. Auto body sheets are firm at 4c., which probably will be reestablished as the price for the third quarter. One producer has already opened its books at that price and will take blue annealed sheets at 2c., Pittsburgh, for the next quarter.

Strip Steel.—Mills continue to get good specifications against contracts from the automotive industry, but there is very little new demand. Hot-rolled strip is fairly steady at 1.75c., Pittsburgh, for 6-in. and wider material and at 1.85c. for 3-in. to 6-in. material. Cold-rolled strip is firm at 2.75c., Cleveland, for 3 tons and over. In the face of a decreased demand for the third quarter, producers see little chance of getting better prices and some are willing to take contracts for the quarter at the above prices.

Wire Products.—One producer has opened its books for the third quarter at the present regular quotations of $2.65 per keg for nails and 2.50c. per lb. for wire. Wire nails appear slightly firmer than recently and have a price range of $2.55 to $2.65 per keg.

Cold-Finished Steel Bars.—Specifications against contracts are good, but there is little new buying. The market is firm at 2.25c., Cleveland.

Warehouse Business.—The demand continues rather slow and orders generally are small. Regular prices are being well maintained.

Old Material.—A Cleveland consumer, who has been securing considerable scrap from Detroit, has purchased 10,000 tons of steel-making scrap for water shipment from that city. This is the only activity reported on the part of consumers. Dealers are buying very little scrap, as they have all the material they need to fill mill orders, on which shipments are still restricted. The market shows no price tendency in either direction. Scrap is plentiful at the quoted prices.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.00 to $13.25
No. 2 heavy melting steel	12.50 to 12.75
Compressed sheet steel	12.50 to 13.00
Light bundled sheet stampings	11.50 to 11.75
Drop forge flashings	11.50 to 11.75
Machine shop turnings	7.00 to 7.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 13.75
No. 1 busheling	11.00 to 11.25
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	9.15 to 9.50
Mixed borings and short turnings	9.15 to 9.50
No. 2 busheling	9.15 to 9.50
Cupola Grades	
No. 1 cast	16.25 to 16.75
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	16.75 to 17.25
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

New York Structural Engineers Organize

The Structural Engineers Society of New York has been formed in that city by a group of structural engineers specializing in building work. The object of the society as set forth in the constitution is the "creation of a better understanding and bond between individuals engaged in the profession, the elimination of practices which are injurious and the promotion of those which are beneficial to the true service of the structural engineer and the upholding of proper standards for the engineer in his relation to other members of the building industry."

The officers of the society are: F. A. Burdett, president; L. A. Ball and N. A. Richards, vice-presidents; E. E. Seelye, secretary; and H. H. Burroughs, treasurer. These men, together with Charles Mayer and A. N. Van Vleck, constitute the board of directors. Headquarters are at room 1111, 101 Park Avenue, New York.

San Francisco

Structural Steel Bookings Large but Other Steel Buying Declines

SAN FRANCISCO, June 2 (*By Air Mail*).—Demand for steel products generally on the Pacific Coast has fallen off, although structural steel bookings this week were the heaviest in over 10 weeks. Most of this tonnage, however, developed in the Los Angeles district. The price structure is not as firm as it was a month ago; plate prices have been shaded $2 a ton by one independent producer.

Outstanding developments include the placing of 1600 tons of blue annealed sheets, 1800 tons of reinforcing bars for the Wildcat and Sequoia aqueducts in Oakland with the Columbia Steel Corporation, the award of 1400 tons of shapes for a theater at Avalon, Cal., and 1300 tons for the Willys-Overland factory in Los Angeles with the Llewellyn Iron Works. The Southern Pacific Co. has inquired for material for 100 cars and eight locomotives, requiring about 5000 tons of plates and shapes.

The Southern Pacific Co. has approved preliminary plans for a bridge across the Carquinez Straits to supplant the present train ferry service. This project will require between 12,000 and 20,000 tons of steel. There will be 10 480-ft. spans, one 750-ft. steel viaduct, and one deck and one lift span totaling a little over 5500 ft. The total cost will be about $10,000,000.

Pig Iron.—No outstanding sales or inquiries are reported. Imports during March totaled 2350 tons, compared with 974 tons for the same month last year. Most of this iron came from British India. Quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Awards were more numerous this week, the total exceeding 3000 tons. In addition to the 1800 tons for the Oakland aqueducts, mentioned above, 325 tons for a warehouse in San Francisco and 250 tons for the Veterans' barracks at Yountville, Cal., were placed with San Francisco distributers. With few exceptions, pending business is confined to lots of less than 100 tons. Out-of-stock prices in the bay district are extremely low, in some cases 1.80c. has been quoted. On less desirable lots 2c. is being obtained. Importations of bars during March totaled 6875 tons, compared with 3678 tons for March last year. Belgian mills sent in 5179 tons and French producers 1393 tons. San Francisco interests took 3814 tons of the total, Los Angeles users 1679 tons and Portland concerns 1206 tons.

Plates.—Few plate awards of size have been made during the past two weeks. The Southern Pacific Co. has taken bids on about 1100 tons of firebox, boiler and sheared plates for eight locomotives and 18 tenders and on 250 tons of material for 50 caboose and 50 gondola cars. Awards are expected next week on two car floats, one for the Santa Fe and one for the Western Pacific, each requiring 700 tons. Prices have weakened; as low as 2.20c. has been quoted, though on the general run of orders 2.30c. still applies.

Shapes.—The structural shape market continues the most active on the Coast; the week's awards totaled 5868 tons. Lettings, other than those mentioned above, included 400 tons for the second unit of the Firestone tire plant in Los Angeles and 300 tons for a grade crossing in the same city, both booked by the Llewellyn Iron Works, and 480 tons for three apartments in San Francisco, taken by McClintic-Marshall Co. Central Works. New and pending business exceeds 13,000 tons. Prices on plain material remain firm at 2.35c., c.i.f. Imports of shapes during March were 4366 tons, compared with 4528 tons for the same month in 1927. San Francisco interests took 1759 tons, Los Angeles users 1517 tons, Portland and Seattle consumers each about 550 tons. Belgian mills shipped 2500 tons and French producers 1550 tons.

Cast Iron Pipe.—Demand for cast iron pipe has fallen off during the past month, and little new business is up for figures. The National Cast Iron Pipe Co. took 229 tons of 4 to 10-in. class B pipe for Inglewood, Cal. San Diego, Cal., placed 227 tons of 4 and 6-in. class B for the improvement of the Otay district with the Miracle Construction Co. of San Diego and 131 tons of 10 and 14-in. class B pipe for a sewer at Pacific Beach with Frank Doran of San Diego. The United States Cast Iron Pipe & Foundry Co. took 100 tons of 4 and 6-in. class 150 pipe for Redwood City, Cal. Bids have been opened on 224 tons of 4 to 10-in. class C pipe for Wells, Nev. The Holdener Construction Co., Sacramento, Cal., was low bidder on 887 tons of 10 to 14-in. class 150 pipe for Lovelock, Nev. Imports in March totaled 2522 tons, compared with 3107 for March last year.

Sheets.—Sheet demand remains spotty. Most of the sales and inquiries involve lots seldom exceeding a carload. The Columbia Steel Corporation took 1600 tons of No. 14 gage blue annealed sheets for the Wildcat and Sequoia aqueducts in Oakland, securing the business from the Lock-Joint Pipe Co., Ampere, N. J., general contractor.

Coke.—Activity in this market reflects the quiet condition noted in the market for pig iron. Melters continue to order in small lots. Imports in March amounted to 7121 tons. English beehive coke is quoted from $15 to $16 a net ton, delivered at dock, while by-product coke ranges from $11.50 to $13 a ton.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.95c.
Blue annealed sheets (No. 10)	3.90c.
Galvanized sheets (No. 24)	5.50c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.40
Cement coated nails, 100-lb. keg	3.40

Birmingham

Steel Business Keeps Up at Good Rate —Pig Iron Dull

BIRMINGHAM, June 5.—Consumers are showing very little interest in third quarter pig iron. Less than a half dozen inquiries have been sent out. One company reports sales for the week to be smaller than for some time, while others notice no change in the volume, all orders being for small tonnage. Shipments are equal to the weekly average for May, which was sufficient to take care of production during the month. A base of $16 is being maintained on foundry iron. The Tennessee company changed furnace No. 5 at Ensley from foundry to basic on May 26. No other changes have been made. Eighteen furnaces are still in blast, 10 on foundry, six on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$16.00
No. 1 foundry, 2.25 to 2.75 sil.	16.50
Basic	15.00

Finished Steel.—New business booked during the week showed a marked increase over the previous week. Demand is good in the majority of the lines, and sales officials foresee an extension of current production and shipping levels into the next quarter. Two good-sized orders for railroad equipment were reported. The Ingalls Iron Works Co. received an order for 2300 tons of fabricated structural steel for the E-Z Opener Bag Co. plant at Tuscaloosa, Ala. Other new business in this line was made up of small orders. Reinforcing steel fabricators experienced a light week from the standpoint of sales, though inquiries were fair. Prices are substantially the same, with the exception of a few slight changes in sheets. The Tennessee company is now operating seven or eight open-hearths at Ensley

and five at Fairfield. The Gulf States Steel Co. continues to work four at Alabama City.

Cast Iron Pipe.—Sales during the week were confined to small tonnages, the largest 225 tons for Talladega, Ala. Bids were opened on a small job at Kings Mountain, Tenn. Recent inquiries have been unimportant in size, but demand from small projects is supporting the market fairly well. Quotations for pressure pipe have strengthened considerably during the past few weeks, and the base prices are now given as $32 to $33 on 6-in. and larger sizes. Shipments during May were the heaviest for several months. Plant operations are unchanged.

Coke.—Current sales of foundry coke are slightly less than a week ago. Fair specifications are being issued by foundries for coke under contract. Quotations remain at $5.

Old Material.—Prices on heavy melting steel have dropped 50c. Other prices continue low and unchanged. Demand is spotty, and sales are in small lots for immediate needs. Shipments are light.

Prices per gross ton delivered Birmingham district consumers' yards:

Heavy melting steel	$8.50 to	$9.00
Scrap steel rails	11.00 to	11.50
Short shoveling turnings	7.50 to	8.00
Cast iron borings		8.00
Stove plate		13.50
Steel axles	19.00 to	20.00
Iron axles	20.00 to	21.00
No. 1 railroad wrought	10.00 to	10.50
Rails for rolling		13.00
No. 1 cast		14.25
Tramcar wheels	12.50 to	13.50
Cast iron carwheels	12.00 to	13.00
Cast iron borings chemical	13.50 to	14.00

Buffalo

Larger Inquiries for Pig Iron—Steel Operations 80 to 85 Per Cent

BUFFALO, June 5.—The General Electric Co. has sent out an inquiry for 3650 tons of foundry and malleable pig iron for delivery to Erie, Pa., Schenectady and Elmira, N. Y., and Bayway, N. J. A Syracuse foundry wants a tonnage of foundry iron, but did not specify the exact amount. Two New Jersey inquiries are in the market, one for 350 tons and the other for 1500 tons of foundry iron. One 200-ton lot of foundry was sold to an eastern New York melter. Miscellaneous inquiry for the week, coupled with the above mentioned, brings the total of pending business to between 6000 and 10,000 tons. Furnaces report that shipments of iron are large.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2 foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	$16.50 to 17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Mill operations continue at about 80 to 85 per cent. Bar and shape business is fair at previously quoted prices. Reinforcing bar business has been brisk. The new Riverside High School, Buffalo, requires 150 tons of bars and 250,000 sq. ft. of wire mesh, which have been placed. The Cazenovia Creek bridge, previously estimated at 800 to 1000 tons, will require 600 tons. The Agfa Ansco Co., Binghamton, placed 450 tons of bars. An addition to the Great Lakes Cement Co.'s plant requires 100 tons. The new Rand Building will require 200 tons. Sheet business is fair. Bolt and nut business is being placed in fairly good volume.

Old Material.—There has been very little new buying. Dealers are busy filling the order reported last week, which now develops to have been for 30,000 tons of No. 1 and No. 2 heavy melting steel and hydraulic compressed sheets. This buyer is also receiving boat-load shipments of scrap from Detroit at the rate of about two a week. One of the larger foundries is holding up shipments and another foundry is on a quota basis. A small tonnage of short borings and turnings was sold at $10.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades		
No. 1 heavy melting steel	$14.50 to	$14.75
No. 2 heavy melting steel	12.50 to	13.00
Scrap rails	13.50 to	14.00
Hydraulic compressed sheets	12.50 to	13.00
Hand bundled sheets	8.50 to	9.00
Drop forge flashings	12.00 to	12.50
No. 1 busheling	13.00 to	13.50
Heavy steel axle turnings	12.50 to	13.00
Machine shop turnings	8.00 to	8.50
Acid Open-Hearth Grades		
Railroad knuckles and couplers		15.50
Railroad coil and leaf springs	15.50 to	16.00
Rolled steel wheels	15.00 to	15.50
Low phosphorus billet and bloom ends	16.50 to	17.00
Electric Furnace Grades		
Heavy steel axle turnings	12.75 to	13.25
Short shoveling steel turnings	10.75 to	11.25
Blast Furnace Grades		
Short shoveling steel turnings	10.50 to	11.00
Short mixed borings and turnings	9.50 to	10.00
Cast iron borings	9.25 to	9.75
No. 2 busheling	9.00 to	9.25
Rolling Mill Grades		
Steel car axles	16.00 to	16.50
Iron axles	21.00 to	22.00
No. 1 railroad wrought	12.00 to	12.50
Cupola Grades		
No. 1 machinery cast	14.50 to	15.00
Stove plate	13.00 to	13.25
Locomotive grate bars	11.50 to	12.00
Steel rails, 3 ft. and under		16.50
Cast iron carwheels	12.50 to	13.00
Malleable Grades		
Railroad		15.00
Agricultural		15.00
Industrial		15.00

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finishing flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb.	3.90

St. Louis

Pig Iron Melt Declining and Buying Is Light

ST. LOUIS, June 5.—Buying of pig iron in this market continues light. Sales of the St. Louis Gas & Coke Corporation totaled less than 2500 tons. The market is still unsettled as a result of the recent decline of 50c. a ton in the price of Northern iron at Chicago because of Lake competition, and the melt has declined, so that most consumers have sufficient stocks to last them through the second quarter. Buying for third quarter has been light, but makers expect there will be renewed activity in the latter part of June. The principal sale of the Granite City maker was 125 tons of malleable

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized Sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets (No. 24)	4.50c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller 100 lb. or more	70
Less than 100 lb.	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, squares, blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

to an Illinois jobbing foundry. An Iowa implement maker took 500 tons of foundry iron. The Granite City maker has not changed its prices.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.00
Northern No. 2 fdy., delivered St. Louis	20.16
Southern No. 2 fdy., delivered	$19.92 to 20.42
Northern malleable, delivered	20.16
Northern basic, delivered	20.16

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Consumption of foundry grades has fallen off as a result of the smaller melt of pig iron, and takings from the ovens are below contract obligations.

Finished Iron and Steel.—The Granite City Steel Co. reports that the slight improvement in the demand for galvanized sheets, which manifested itself a week or two ago, continues and its volume is quite a bit greater than it was a few weeks ago. The tonnage booked during May was above that taken in April, although not quite as heavy as March specifications. While figures are not complete, warehouse business for May is expected to run about the same as in April, but about 20 per cent less than in May, 1927. Structural awards during the week totaled 650 tons, all to the Mississippi Valley Structural Steel Co., and the only reinforcing bar project of consequence, a waterworks reservoir at Evansville, Ind., 600 tons, went to the Laclede Steel Co.

Old Material.—The market for old material is quiet. The only price change is a reduction of 50c. a ton on stove plate. Consumers bought very little during the week, and about the only activity is among dealers, who are buying to cover recent heavy orders for heavy melting steel. Railroad lists follow: Pennsylvania, 45,630 tons; Baltimore & Ohio, 18,045 tons; Atchison, Topeka & Santa Fe, 5945 tons; Chicago & Western Indiana, 14 carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

Heavy melting steel	$11.00 to $11.50
No. 1 locomotive tires	12.00 to 12.50
Heavy shoveling steel	11.00 to 11.50
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.50 to 13.00
Railroad springs	13.50 to 14.00
Bundled sheets	8.75 to 9.25
No. 2 railroad wrought	11.25 to 11.75
No. 1 busheling	9.75 to 10.25
Cast iron borings	9.00 to 9.50
Iron rails	13.00 to 13.50
Rails for rolling	13.00 to 13.50
Machine shop turnings	7.00 to 7.50
Steel car axles	17.50 to 18.00
Iron car axles	23.50 to 24.00
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	10.00 to 10.50
Steel rails, less than 3 ft.	15.00 to 15.50
Steel angle bars	12.00 to 12.50
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	13.00 to 13.50
Railroad malleable	11.50 to 12.00
No. 1 railroad cast	13.00 to 13.50
Stove plate	11.50 to 12.00
Agricultural malleable	12.00 to 12.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Youngstown

Steel Production Continues This Week at 70 to 75 Per Cent

YOUNGSTOWN, June 5.—Steel production in the Youngstown district continues for the first week in June at 70 to 75 per cent. The Steel Corporation properties are averaging somewhat higher than those of the independents. Production of the Valley plants of the A. M. Byers Co., Pittsburgh, is being accelerated. Finishing mills of the Byers properties are operating three shifts of 8 hr. each continuously from Sunday night until the following Saturday morning. Puddle mill departments operate five days per week, two turns daily, which is considered close to capacity. This production rate compares with an operation of 50 per cent at the beginning of the year and reflects the larger demand for wrought iron by the company's finishing mills.

Of 53 independent open-hearth furnaces in the Mahoning Valley, 34 are melting, a rate little changed from that of preceding weeks; 108 of 127 sheet mills are under power; tin plate output averages 70 per cent with the independents and 80 per cent with the district plants of the American Sheet & Tin Plate Co.; independent bar mills are at 60 per cent, with Steel Corporation units at 75 per cent. There has been a moderate decrease in steel pipe schedules, but 12 of 20 mills are rolling.

It is the opinion of President Elmer T. McCleary of the Republic Iron & Steel Co. that independents will be able to maintain a fairly satisfactory production rate during the summer. He bases this belief upon the fact that important consumers have been keeping purchases at a minimum for some time and their stocks of steel in consequence are low. In order for them to maintain manufacturing operations, he believes they will come into the market in a fairly active way during the mid-summer months. The usual summer recession in the industry, he feels, will not be so pronounced nor of such long duration this year.

Cincinnati

Melters Slow to Buy Third Quarter Pig Iron—Sheet Orders Heavier

CINCINNATI, June 5.—While third quarter pig iron inquiries have appeared in slightly greater volume, sales have been negligible. The largest order in the past week called for 500 tons of Southern foundry for a consumer in the Cincinnati district. Pending business includes 750 tons of malleable for a Richmond, Ind., foundry, 500 tons of Northern foundry for a Hamilton, Ohio, company and 500 tons of foundry for a central Indiana melter. Dealers estimate that only a small percentage of the iron required for third quarter has been purchased by users in this territory. The hesitancy in forward buying is attributed to the uncertainty regarding the turn which business is likely to take and also to the rather weak price situation. There has been no change in quotations. Alabama and Tennessee irons remain firm at $16, base Birmingham, southern Ohio foundry at $19, base Ironton, and Jackson County silvery at $25, base furnace, for 8 per cent.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy. sil. 1.75 to 2.25	19.69
Alabama fdy. sil. 2.25 to 2.75	20.19
Tennessee fdy. sil. 1.75 to 2.25	19.69
Southern Ohio silvery 8 per cent	26.89

Freight rates $1.89 from Ironton and Jackson Ohio; $3.69 from Birmingham.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars soft steel or iron	3.30c.
New billet reinforcing bars	3.15c.
Rail steel reinforcing bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire per 100 lb.	$3.00
Common wire nails base per keg	2.95
Cement coated nails base 100 lb. keg	2.95
Chain per 100 lb.	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes 2-in.	19.00
4-in.	39.00

Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$11.00 to $11.50
Borings and short turnings	7.25 to 7.75
Long turnings	6.75 to 7.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.50 to 21.00
Hydraulic compressed sheets	9.75 to 10.25
Stove plate	11.00 to 12.00
No. 1 busheling	8.50 to 9.00
Sheet clippings	6.00 to 7.00
Flashings	9.25 to 9.75

Finished Material.—The situation is more encouraging than a week ago, the favorable turn having been caused by heavy specifications and orders for steel sheets received by district sheet mills. The activity in this line, however, is in contrast with the dullness which continues in bars, structural shapes and plates. Demand for structural steel is still lagging below normal for this time of the year, and prospects for the immediate future are not good. The only major project pending at the moment is 400 tons for airplane hangars at Wright Flying Field, Dayton, Ohio, but a highway bridge across the Ohio River at Louisville, requiring about 14,000 tons of steel, is expected to come out for bids before the end of June. Meanwhile, fabricators are moderately busy on numerous small jobs. Bars, structural shapes and plates are firm at 1.85c., base Pittsburgh, and indications are that an attempt will be made to secure $2 a ton more for third quarter, although practically no inquiry for that delivery has developed. In wire goods, shipments have been about equal to those in the same period of 1927. Common wire nails are reported to be bringing $2.50 per keg, base Ironton, plus a barge rate for delivery to Ohio River consuming points. Plain wire remains at $2.40 per 100 lb., base Ironton. Releases of contract specifications for sheets have been heavy and in the case of one district mill, bookings have been the second largest in the company's history. For blue annealed stock, sellers are getting 2c., base Pittsburgh, on the average run of material, but this is shaded possibly $2 a ton on large orders. Black sheets range from 2.70c. to 2.80c., base Pittsburgh, while automobile body sheets are steady at 4c.

Reinforcing Bars.—Despite the scarcity of major projects, the number of jobs ranging from 25 to 100 tons is large enough to keep the volume of sales up to a fairly good level. New billet bars are quoted at 1.85c. base Pittsburgh, and rail steel bars at 1.80c., base mill.

Warehouse Business.—Shipments of reinforcing bars out of local warehouses have been liberal in volume, while orders for soft steel bars, structural shapes and plates also have been well sustained. Sales of steel sheets, however, have been rather light. There has been no change in prices, which are firm.

Coke.—Shipments of by-product foundry coke have fallen off sharply in the past week, and one important dealer declares that specifications have declined almost to the low point reached last fall. There also has been a lessened interest in domestic grades, although sales have been fairly well maintained. The slowing down in the demand for by-product foundry coke is reported to be responsible for plans to lower prices at Detroit. Just how much of a cut will be made has not yet been determined, but some dealers believe that it may amount to $1 a ton.

Foundry coke prices per net ton delivered Cincinnati: By-product coke $9.02; Wise County coke, $7.09 to $7.59; New River coke, $9.09 to $9.59 Freight rates $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Heavy melting steel has declined 25c. a ton and other items reflect the weakness of the market. Curtailment of steel plant operations and the dullness in foundry grades are the immediate causes of the decrease. The Norfolk & Western is taking bids this week on its monthly list totaling approximately 10,000 tons, while the Louisville & Nashville has put out a special list consisting of 12,000 tons of No. 1 steel rails.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$10.75 to $11.25
Scrap rails for melting	11.25 to 11.75
Loose sheet clippings	8.25 to 8.75
Bundled sheets	9.25 to 9.75
Cast iron borings	7.75 to 8.25
Machine shop turnings	7.25 to 7.75
No. 1 busheling	10.00 to 10.50
No. 2 busheling	7.00 to 7.50
Rails for rolling	12.50 to 13.00
No. 1 locomotive tires	12.75 to 13.25
No. 1 railroad wrought	10.00 to 10.50
Short rails	15.75 to 16.25
Cast iron carwheels	12.25 to 12.75
No. 1 machinery cast	15.25 to 15.75
No. 1 railroad cast	12.75 to 13.25
Burnt cast	7.50 to 8.00
Stove plate	8.25 to 8.75
Brake shoes	9.50 to 10.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	11.00 to 11.50

Boston

Heavy Scrap Exports to Danzig—Pig Iron Competition Keen

BOSTON, June 5.—The Mystic and Champlain furnaces have taken most of the pig iron business placed in New England during the past week. The competition between these furnaces is very keen. Their combined sales in the last two weeks were about 10,000 tons. The price situation has shown no improvement. Buffalo iron is still being offered at $16, base furnace, and the Mystic and Champlain stacks are meeting the Buffalo delivered prices when necessary. Buffalo malleable iron has been offered in this market at $16.50, furnace. The Rhode Island Malleable Co., Phillipsdale, R. I., bought 450 tons of malleable iron at a reported delivered price of $21, and may take about 450 tons additional. The Mystic furnace sold 1200 tons to a Worcester melter, making a total of 1500 tons, whereas the foundry's original inquiry was for 500 to 1000 tons. Another Worcester plant has bought 300 tons. There is only one open inquiry in the market, that being for 500 to 1000 tons of No. 1X for third quarter, with an option on fourth quarter delivery on part of it.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.91
Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil. 1.75 to 2.25	25.71
Virginia, sil. 2.25 to 2.75	26.21
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Importations.—Importations of pig iron here in May, at 248 tons, were the smallest for any month this year. Importations for the first five months of this year totaled 4731 tons, compared with 13,487 tons in the corresponding months of last year. Imports of ore in May amounted to 16,828 tons.

Coke.—The New England Coal & Coke Co. and the Providence Gas Co. report that 100 per cent of regular customers have signed contracts for last half by-product foundry coke requirements. Current foundry requirements are larger than a month ago and a year ago, yet are below normal. June shipments are being made at $11 a ton, delivered within a $3.10 freight rate zone. Domestic coke is moving in large volume, almost exclusively, however, to dealers who are stocking up for fall and winter.

Shapes and Plates.—The naming of 1.90c. per lb., base Pittsburgh, on shapes and plates by leading mills has failed so far to force third quarter contracting. The largest consumers are still protected to a degree on

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

prospective tonnages, and owing to the labor situation there is little incentive to anticipate steel requirements.

Steel Fabricating Work.—The Boston iron workers' strike situation is deadlocked. Except on one local job, operating on cost plus, striking workers are still out. Intimations are that fabricators propose to establish themselves on an open shop basis. The strike has spread to outside points. In addition, other branches of the building trades are striking for higher wages, and automobile truck drivers employed by fabricators are on "vacation." The construction situation is decidedly unsettled at the moment. Members of iron workers' unions employed on bridges in western Massachusetts, New Hampshire, Vermont and Maine are still working.

Bars.—Most of the large mills have advanced steel bars to 1.90c. per lb., base Pittsburgh. Regardless of the stiffer mill prices, all local jobs on reinforcing bars are going at less than 2.90c. per lb., base, from stock.

Cold-Rolled Strip.—Cold-rolled strip makers have opened their books for third quarter. Orders are coming in very slowly. The American Steel & Wire Co. quotes 3.30c. per lb., base Worcester, for 1 to 3 ton lots, while other rollers ask 3.15c. per lb., base Pittsburgh. Less than 3.30c., Worcester, can be done on large lots.

Old Material.—Exports of scrap from this port to Danzig continue to feature the market. A steamer with 5000 tons left Boston May 30, the fourth shipment this year. Another steamer finished loading 4500 tons June 2 and sailed the following day; still another will complete loading approximately 4500 tons this week; and another with about 5000 tons is due to sail July 5. For export, $9.50 to $10 on cars, dock, is paid for No. 1 steel, and around $7.25 for good yard steel. Total exports on this movement, according to report, will approximate 50,000 tons and will, it is believed, be used in the production of structural steel. Small tonnages will have been exported from other New England ports. The scrap market, aside from export business, is dull. Apparently there has been some modifications in prices on a few materials, but no significance is attached to such changes. Sales of railroad malleable to New England consumers at $13.50 a ton, delivered, were made. Machinery cast sales were few and far between at former prices.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.60 to $9.00
Scrap T rails	8.50 to 9.00
Scrap girder rails	7.50 to 8.00
No. 1 railroad wrought	9.00 to 9.50
No. 1 yard wrought	7.00 to 7.50
Machine shop turnings	5.50 to 5.75
Cast iron borings (steel works and rolling mill)	5.75 to 6.25
Bundled skeleton, long	5.50 to 6.25
Forge flashings	5.60 to 7.00
Blast furnace borings and turnings	5.50 to 5.75
Forge scrap	6.00 to 6.25
Shafting	13.00 to 13.50
Steel car axles	14.50 to 15.00
Wrought pipe 1 in. in. diameter (over 2 ft. long)	7.00 to 7.50
Rails for rolling	10.00 to 10.25
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton delivered consumers' yards:

Textile cast	$13.25 to $13.50
No. 1 machinery cast	14.00 to 14.50
No. 2 machinery cast	12.50 to 13.50
Stove plate	10.00 to 10.50
Railroad malleable	13.00 to 13.50

Canada

Blowing in of Port Colborne Furnace May Curb Pig Iron Imports

TORONTO, ONT., June 5.—Pig iron sales show very little change from those of a week ago. Some inquiry for forward delivery is appearing, but producers and consumers appear to have difficulty in reaching a satisfactory price level, and as a consequence business of this kind is delayed. The demand for prompt shipment, however, is holding to the recent level. Local blast furnace representatives report a steady flow of orders ranging from 50 to 200 tons. The blowing in of the Victoria furnace of the Canadian Furnace Co., Port Colborne, Ont., on May 24 brings the total number of active stacks in Canada to seven. The blowing in of the Port Colborne stack will, it is expected, have a tendency to curb imports of foundry and malleable iron in the Niagara peninsula, as it is ideally located to supply the local market as well as other districts in Ontario, especially on the Great Lakes. Canadian pig iron prices are unchanged, although shading continues in some districts.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.10 to $23.60
No. 2 foundry, sil. 1.75 to 2.25	23.10 to 23.60
Malleable	23.10 to 23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	24.50 to 25.00
No. 2 foundry sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	24.00
Imported Iron at Montreal Warehouse	
Sumerlee	33.50
Carron	33.00

Old Material.—Current demand is confined to small tonnages. Mills are receiving deliveries against old contracts and in some instances are placing orders for special grades. Foundries are responsible for the greater part of current demand. Electric furnace requirements are large. Prices are unchanged but are weak.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Detroit

May Automobile Production Gained and Outlook for June Is Good

DETROIT, June 5.—The May totals of automobile production thus far available include those for Dodge Brothers, Hudson-Essex, Hupp, Packard and Reo, and show a combined total of 71,431, as against 68,226 for April, or a gain of nearly 5 per cent. Dodge Brothers' May production dropped 2716 units below that of April, the May total being 19,717 units. This is the only case, from the figures now at hand, of a decline from April.

The merger of the Dodge and Chrysler companies gives a potential output in existing plants of the two companies of 1,000,000 cars a year. Construction is just being started at the Jefferson Avenue plant of a building 150 x 1600 ft. for the manufacture of the Chrysler 62. Three Chrysler models will be built at the Jefferson Avenue plant; the Fargo truck will be built in the Highland Park plant, and the Dodge Brothers' models and Graham trucks are to be continued in the Hamtramck plant. The total number of units produced by Dodge Brothers in the first five months of this year ran 102,560, against 83,781 in the corresponding period of 1927, or a gain of 22.4 per cent.

Production of Hudson and Essex cars during May amounted to 32,450 units, or an increase of more than 12 per cent over that of April. Total shipments to June 1 were 151,886, compared with 145,252 in the corresponding period of 1927. The first five months of this year were the largest five-months' period in Hudson-Essex history. June is scheduled at approximately 30,000 cars.

Hupp also made a record in May, with shipments of

(*Concluded on page* 1652)

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	June 5	June 4	June 2	June 1	May 31	May 29
Lake copper, New York	14.87½	14.87½	14.87½	14.87½	14.87½	14.87½
Electrolytic copper, N. Y.*	14.50	14.50	14.50	14.50	14.50	14.50
Straits tin, spot, N. Y.	49.25	49.50	....	49.75	49.87½	50.55
Lead, New York	6.30	6.30	6.30	6.30	6.30	6.30
Lead, St. Louis	6.17½	6.17½	6.17½	6.17½	6.17½	6.17½
Zinc, New York	6.47½	6.47½	6.47½	6.47½	6.47½	6.47½
Zinc, St. Louis	6.12½	6.12½	6.12½	6.12½	6.12½	6.12½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, June 5.—The holiday last week slowed up activity somewhat. Copper continues strong, but not so active. Tin prices have fallen quite sharply, with buying fairly large. Lead has been advanced again, but quotations for zinc have remained practically unchanged for nearly two weeks.

Copper.—Sales of copper for May are estimated by the trade at not less than 415,000,000 lb., and approximately half of this was for export. Sales to foreign consumers in May were therefore a record for all time. Naturally the market is not as active as it has been. Domestic consumers are not buying much, but sales to foreign users continue in good volume. June metal is scarce, although a premium has not yet been asked for spot or June. Electrolytic copper is quoted at 14.75c., delivered in the Connecticut Valley, and Copper Exporters, Inc., continues to maintain its quotation unchanged at 15c., c.i.f. European ports. Lake copper is obtainable at 14.87½c., delivered.

Copper Averages.—The average price of Lake copper for the month of May, based on daily quotations in THE IRON AGE, was 14.50c., delivered. The average price of electrolytic copper was 14.19c., refinery, or 14.44c., delivered in the Connecticut Valley.

Tin.—With two holidays, one in London and one in New York, this market has had a short week. Total sales for the week ended June 2 amounted to about 700 to 800 tons. The feature of the market has been a sharp decline in prices, which has been caused by declarations of 800 to 1000 tons of tin available for June delivery thus early in the month. This has caused spot prices to fall, with the situation for this delivery changing from a premium to a discount. On May 29 spot tin was sold at a premium of about ¼c. over August, but on June 1 it dropped to a discount of ⅜c. from the August position. Deliveries into consumption in May were 5335 tons, which is much smaller than for some time, and the amount of tin in stock and landing on May 31 was 3708 tons, which is much the largest in many months. The increase in stocks in store was large, but this metal could have been shipped away if consumers had needed it. The visible supply in the United States on May 31 was 10,282 tons, regarded as ample, and the increase in the world's visible supply was 2063 tons, bringing it to 17,064 tons. The most active day in the past week was May 29 when 400 to 500 tons changed hands. Yesterday, Monday, about 250 tons changed hands and today the market has been quite dull, with spot Straits tin quoted at 49.25c., New York, the lowest since Oct. 9, 1924. London prices today were: Spot standard, £223 15s.; future standard, £232 5s., and spot Straits, £226 5s. The Singapore price today was £226 5s.

Lead.—On May 29 the American Smelting & Refining Co. advanced its contract price for the third time recently from 6.20c. to 6.30c., New York. In the outside market prices are correspondingly higher and firm at 6.17½c. to 6.20c., St. Louis. Consumers have been buying in good volume, but demand is not so large as in the early period of the advance. Some desire to buy for August, but producers are not eager to sell for that position.

Zinc.—Producers report a fairly good demand each day with specifications on contract eminently satisfactory. Most of them are asking and obtaining 6.15c., St. Louis, at which level most sales are being made, but some prime Western zinc is still available at 6.12½c., St. Louis. The market is quotable at 6.12½c. to 6.15c., St. Louis, or 6.47½c. to 6.50c., New York. Ore prices were unchanged last week at $40 per ton,

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	52.00c. to 53.00c.
Tin, bar	54.00c. to 55.00c.
Copper, Lake	15.75c.
Copper, electrolytic	15.50c.
Copper, casting	14.75c.
Zinc slab	7.25c. to 7.75c.
Lead, American pig	7.25c. to 7.75c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	12.50c. to 13.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99 per cent pure)	25.00c. to 26.00c.
Aluminum ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	32.50c. to 33.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, traits pig	54.50c.
Tin, bar	58.50c.
Copper, Lake	14.85c.
Copper, electrolytic	14.85c.
Copper, casting	14.00c.
Zinc, slab	7.50c.
Lead, American pig	7.10c.
Antimony, Asiatic	16.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	58.00c.
Solder, ½ and ½	31.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	19.25c.
Copper, hot rolled	24.00c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Seamless Tubes—	
Brass	24.12½c.
Copper	25.00c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	9.50c. to 10.00c.
Zinc sheets open	10.50c. to 11.00c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are still being quoted at the advance of ¼c. announced on May 25. Quotations on lead full sheets were advanced ¼c. on May 29, the price now being 10c. to 10.25c., base. Zinc sheets are unchanged at 9c., base.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.25c.
Copper, hot rolled	23.50c.
Zinc	9.00c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	24.12½c.
Copper	25.00c.
Rods—	
High brass	17.00c.
Naval brass	19.75c.
Wire—	
Copper	18.75c.
High brass	19.75c.
Copper in Rolls	22.50c.
Brazed Brass Tubing	27.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	23.50c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.62½c.
Copper	26.50c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

with sales of about 13,500 tons and production about 11,000 tons.

Nickel.—Wholesale lots of ingot nickel are quoted unchanged at 35c., with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Antimony.—The market is dull with a tendency to weakness and Chinese metal is quoted nominal at 10.50c., New York, duty paid, for all positions.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is available at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, June 5.—Price advances are noted in lead and zinc and quotations are lower on tin. Sales in this district have been in fair volume. Old metal prices are steady in a moderately active market.

Prices, per lb., in carload lots: Lake copper, 14.62½c.; tin, 51.50c.; lead, 6.35c.; zinc, 6.25c.; in less-than-carload lots, antimony, 12.75c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.50c.; yellow brass, 7.25c.; lead pipe, 4.75c.; zinc, 3.50c; pewter, No. 1, 30c.; tin foil, 36.25c.; block tin, 45.25c.; aluminum, 12c.; all being dealers' prices for less-than-carload lots.

Old Metals, Per Lb., New York

The buying prices represent what the large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.25c.	13.875c.
Copper, heavy and wire	12.25c.	13.25c.
Copper, light and bottoms	10.50c.	11.75c.
Brass, heavy	7.25c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	9.50c.	10.875c.
No. 1 yellow brass turnings	8.25c.	9.25c.
No. 1 red brass or composition turnings	9.00c.	10.00c.
Lead, heavy	5.00c.	5.50c.
Lead, tea	4.00c.	4.50c.
Zinc	3.00c.	3.50c.
Sheet aluminum	12.75c.	14.50c.
Cast aluminum	12.50c.	14.00c.

RAILROAD EQUIPMENT

Order for 200 Flat Cars and Inquiry for 250 Stock Cars

THE Chicago, St. Paul, Minneapolis & Omaha has purchased 200 flat cars and has come into the market for 250 stock cars. An inquiry from the Chicago, Rock Island & Pacific calls for 250 gondola bodies. Distribution of the Southern Pacific's order for 62 passenger train cars has been announced.

Class I railroads installed 561 locomotives in the first four months this year, according to reports filed by the carriers with the Car Service Division of the American Railway Association. This was a decrease of 73, as compared with the corresponding period last year, and of 198 compared with the corresponding period in 1926. During April the railroads placed in service 96 locomotives, compared with 187 in April, 1927. Locomotives on order on May 1 totaled 137, compared with 217 on May 1, 1927.

Freight cars installed in service in the first four months of 1928 totaled 15,635, compared with 22,066 for the same period in 1927 and 31,980 in the first four months of 1926. Freight cars installed in April this year totaled 5571, compared with 6270 in April, 1927. The railroads had 22,242 freight cars on order May 1, compared with 26,675 on the same date last year and 48,762 on May 1, 1926.

Details of the week's business follow:

Chicago & Illinois Midland is in the market for two Mikado locomotives.

Vancouver Harbor Commission, Vancouver, B. C., has ordered one locomotive from American Locomotive Co.

Chicago, St. Paul, Minneapolis & Omaha has ordered 200 flat cars from Pullman Car & Mfg. Corporation. This road has also made definite inquiry for 250 stock cars.

Illinois Central will purchase two 20-ton air dump cars.

Chicago, Rock Island & Pacific is in the market for 250 50-ton gondola car bodies.

Missouri-Kansas-Texas expects to buy six baggage-mail cars.

American Oil Co., Baltimore, has ordered two three-compartment tank cars from General American Tank Car Corporation.

Southern Pacific's order for 62 passenger cars, mentioned in this column last week, was distributed as follows: Six dining cars and five compartment coaches with Pullman Car & Mfg. Corporation, 10 baggage cars and 10 coaches with Standard Steel Car Co., 25 steel coaches with American Car & Foundry Co., and six baggage and mail cars with Bethlehem Steel Co.

Columbus & Greenville has ordered two 73-ft. gas-electric rail motor cars and two 73-ft. passenger trailers from J. G. Brill Co.

Southern Cotton Oil Co., Savannah, Ga., has ordered 10 8000-gal. tank cars from American Car & Foundry Co. and 10 from General American Tank Car Corporation.

REINFORCING STEEL

Chicago Mercantile Mart Will Take 6000 Tons —1800 Tons in California Aqueducts

AWARDS of 6300 tons included 1800 tons for two aqueducts at Oakland, Cal. The Chicago Mercantile Mart, requiring 6000 tons, and an apartment development in the same city, calling for 1600 tons, made up the bulk of new projects reported for the week, the total being 8300 tons. Awards follow:

STATE OF NEW JERSEY, 600 tons, road work, to Igoe Brothers; 250 tons from C. H. Winans Co., Elizabeth, general contractor, and 350 tons from Ross & Taylor, Trenton.

BUFFALO, 100 tons, addition to plant of Great Lakes Cement Co., to a local maker.

BUFFALO, 150 tons and 250,000 sq. ft. of mesh, Riverside High School, to a Buffalo maker.

EVANSVILLE, IND., 600 tons of rail steel, reservoir for municipal waterworks, to Laclede Steel Co.

EVANSTON, ILL., 280 tons of rail steel bars, apartment building at Hinman Avenue and Grove Street, to Calumet Steel Co.

STATE OF ILLINOIS, 200 tons of rail steel bars, road work, to Calumet Steel Co.

CHICAGO, 130 tons, St. Michaels High School, to an unnamed bidder.

CHICAGO, 160 tons, Hugoelet apartment building, to Concrete Steel Co.

CHICAGO, 100 tons, Wabash Avenue Exchange for Illinois Bell Telephone Co., to Jones & Laughlin Steel Corporation.

CHICAGO, 250 tons, Shiller Park viaduct, to Jones & Laughlin Steel Corporation.

CHICAGO, 700 tons, building for Cuneo Printing Co., to Truscon Steel Co.

SAN FRANCISCO, 325 tons, warehouse, Third and Paul Streets, to Badt-Falk Co.

OAKLAND, 1800 tons, Wildcat and Sequoia aqueducts, to Columbia Steel Corporation.

SACRAMENTO, CAL., 166 tons, paving in Marin County, to Hanrahan Co., San Francisco.

SACRAMENTO, 100 tons, five bridges in Sacramento County, to unnamed company.

IONE, CAL., 125 tons, three school buildings for Preston State School, to San Francisco jobber.

YOUNTVILLE, CAL., 350 tons, State Veterans' Barracks, to San Francisco jobber.

SEATTLE, WASH., 155 tons, piers for West Waterway bridge, to Puget Sound Bridge & Dredging Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

GREENWICH, CONN., 250 tons, printing building for Condé Nast Publications, Inc.; bids June 5.

LONG ISLAND CITY, N. Y., 275 tons, post office; bids June 7.

BUFFALO, 200 tons, Rand Building.

CHICAGO, 1600 tons, apartment community development by Marshall Field Estate.

CHICAGO, 6000 tons, Mercantile Mart.

"OVERCAPACITY NO ALIBI"

O. H. Cheney, Banker, Tells Flat Rolled Steel Executives It Does Not Excuse Price Cutting and Low Profits

WHITE SULPHUR SPRINGS, W. VA., June 5.—Declaring that excess producing capacity is the chief alibi of steel companies in cutting prices and that this factor cannot justly be held accountable for the unsatisfactory profits which have ruled recently, O. H. Cheney, vice-president American Exchange-Irving Trust Co., New York, at the opening business session this morning of the first annual meeting of Flat-Rolled Steel Executives at the Greenbrier Hotel suggested that it is the fear of excess capacity that has contributed to the present unhealthy situation. Mr. Cheney emphasized that research and education will play the largest parts in maintaining and extending markets as well as in stabilizing conditions in the flat-rolled steel industry and that the trade association is the legitimate and logical means for promoting this work.

Charles O. Hadly, vice-president Alan Wood Iron & Steel Co., Philadelphia, presided at the session, and on behalf of the sheet industry welcomed the executives of the hot and cold-rolled strip industry to the meeting. F. C. Gifford, vice-president Acme Steel Co., Chicago, responded as the representative of the strip industry.

At a meeting of the executive committee of the National Association of Flat-Rolled Steel Manufacturers this morning, B. E. Kibbee, vice-president Sharon Steel Hoop Co., Sharon, Pa., and C. G. Thomas, president Thomas Steel Products Co., Warren, Ohio, were added to the board of directors, which now has 18 members.

Wednesday morning's session will be devoted to a discussion of trade extension work and the final session on Thursday to association activities. The program also includes group meetings of the sheet steel, hot-rolled strip and cold-rolled divisions.

FABRICATED STRUCTURAL STEEL

New York Office Building Takes 16,000 Tons—10,000 Tons Needed for Hotel

WITH an office building in New York taking 16,000 tons, awards reported during the week amounted to 32,900 tons. New projects totaled only 14,600 tons, 10,000 tons of which will be required for a New York hotel. Awards follow:

STOCKBRIDGE, MASS., 100 tons, bridge, to Palmer Steel Co.

NEW YORK, 16,000 tons, Lincoln Building on East Forty-second Street, to an unnamed fabricator.

NEW YORK, 4000 tons, office building on John Street, from Starrett Brothers, general contractors, to Hedden Iron Construction Co.; reported last week to unnamed fabricator.

BUFFALO, 200 tons, stand pipes for Western New York Water Co., to Pittsburgh-Des Moines Steel Co.

PHILADELPHIA, 510 tons, Pennsylvania Railroad warehouse at Venango and D Streets, to Belmont Iron Works.

PHILADELPHIA, 200 tons, building for Kensington Trust Co., to Bethlehem Steel Co.

READING RAILROAD, 140 tons, two single track girder spans on Shamokin division, to Phoenix Bridge Co.

PENNSYLVANIA RAILROAD, 600 tons, bridges, to Bethlehem Steel Co.

NAZARETH, PA., 450 tons, kiln building and turbine room for Nazareth Cement Co., to Bethlehem Construction Co.

IMPERIAL, PA., 130 tons, bridge work, to McClintic-Marshall Co.

SOUTHERN RAILWAY, 900 tons, bridges, to American Bridge Co.

TUSCALOOSA, ALA., 2300 tons, E-Z Opener Paper Bag Co. plant, to Ingalls Iron Works Co.

SAN ANTONIO, TEX., 1700 tons, theater, to Petroleum Iron Works, Beaumont, Tex.

CLEVELAND, 600 tons, Parkhurst and Nathan Hale schools, to Wellman-Seaver-Morgan Co.

CLEVELAND, 975 tons, Lake Shore Hotel, to Forest City Structural Steel Co.

TOLEDO, OHIO, 325 tons, Toledo Hospital extension, to American Bridge Co.

MARIETTA, OHIO, 110 tons, bridge for State of Ohio, to Pittsburgh-Des Moines Steel Co.

MIDDLETOWN, OHIO, 167 tons, storage runway, to McClintic-Marshall Co.

GARY, IND., 700 tons, Lake County Court House, to A. Bolter's Sons, Chicago.

STATE OF ILLINOIS, 260 tons, highway bridge, to Lakeside Bridge & Steel Co.

SOUTH CHICAGO, ILL., tonnage not stated, frame work for coke handling plant for Youngstown Sheet & Tube Co., to Vierling Steel Works, Chicago.

CHICAGO, 215 tons, store building at Diversey Boulevard and Broadway, to Duffin Iron Co., local.

MILWAUKEE, 200 tons, new Lincoln Avenue bridge, to Milwaukee Bridge Co.

ST. LOUIS, 650 tons, girders and columns for warehouse for J. C. Penney Co., 350 tons; columns for Lennox Hotel, Ninth and Washington Avenues, 300 tons, to Mississippi Valley Structural Steel Co.

MANHATTAN, KAN., 260 tons, State highway bridge, to St. Joseph Structural Steel Co.

SAN FRANCISCO, 150 tons, office building, Pine and Leisdorff Streets, to California Steel Co.

SAN FRANCISCO, 480 tons, three apartment buildings, to McClintic-Marshall Co.

OAKLAND, 140 tons, office building, Fourteenth and Webster Streets, to Pacific Coast Engineering Co.

SAN JOSE, CAL., 100 tons, laundry building, to Herrick Iron Works.

LOS ANGELES, 400 tons, second unit Firestone Tire & Rubber Co. plant, to Llewellyn Iron Works.

LOS ANGELES, 300 tons, grade crossing, Riverside Drive, to Llewellyn Iron Works.

LOS ANGELES, 1300 tons, Willys-Overland automobile plant, to Llewellyn Iron Works.

LOS ANGELES, 250 tons, apartment building, Kenmore and Wilshire Boulevards, to Llewellyn Iron Works.

LOS ANGELES, 140 tons, apartment building, Union and Ingram Streets, to Union Iron Works.

AVALON, CAL., 1400 tons, theater, to Llewellyn Iron Works.

WESTWOOD, CAL., 348 tons, steel stage for Fox Film Corporation, to Baker Iron Works.

GLENDALE, CAL., 260 tons, First Methodist Church, to Llewellyn Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

MAINE CENTRAL RAILROAD, 400 tons, bridge at Lunenberg, Vt.

STATE OF VERMONT, 775 tons, highway bridges.

BOSTON & MAINE RAILROAD, 400 tons, bridges.

WESTCHESTER COUNTY, N. Y., 250 tons, highway bridge.

NEW YORK, 500 tons, loft building on East Sixty-first Street.

NEW YORK, 10,000 tons, New Yorker Hotel at Eighth Avenue, Thirty-fifth and Thirty-sixth Streets.

CLEVELAND, 100 tons, addition for Ohio Foundry Co.

TOLEDO, OHIO, 500 tons, building for Libbey-Owens Glass Co.

DAYTON, OHIO, 400 tons, airplane hangars at Wright Flying Field; bids in.

MANISTEE, MICH., 1000 tons, highway bridge.

JANESVILLE, WIS., 125 tons, Center Avenue overhead bridge; bids about June 15.

POWERTON, ILL., 150 tons, stack and supports for Super Power Co.

Sheet Mill Wage Scales Reaffirmed

YOUNGSTOWN, June 5.—The sheet and tin plate wage scale will be continued for 12 months, beginning July 1, on basis of present agreement, following conference just concluded at Atlantic City. The old scale was largely reaffirmed. Representatives of workers had requested that tonnage rates be based on average selling price of tin plate, rather than on Nos. 26, 27 and 28-gage black sheets.

This week, the conference over the bar iron scale is under way at Atlantic City.

PERSONAL

George C. Scott has been elected president of the United States Steel Products Co., 71 Broadway, New York, succeeding E. P. Thomas, who was recently elected vice-president of the United States Steel Corporation. Mr. Scott started work with the St. Louis Wire Mill Co., under John W. Gates. This company was absorbed by the Consolidated Steel & Wire Co., at which time he was transferred to the latter company's Cleveland office, in charge of export business to the Far East. The company merged with the American Steel & Wire Co. of Illinois in 1898, and Mr. Scott was then transferred to New York, where he was associated in handling the export business with James A. Farrell, then manager of the export department. On the formation of the United States Steel Products Co. in 1903, Mr. Scott became a departmental manager in charge of sales to the Far East, Australia and South Africa. He has traveled extensively and has visited most of the important markets throughout the world.

GEORGE C. SCOTT

—

F. H. Frankland, who has been supervising structural engineer, specializing in steel work, for Dwight P. Robinson & Co., New York, has been made head of the engineering service bureau created by the American Institute of Steel Construction, New York. This bureau will direct and coordinate the work of the ten field engineers recently appointed by the institute. After attending the Sheffield Scientific School of Yale University, Mr. Frankland was engaged in structural engineering work in New Zealand and Australia. Later he returned to the United States and was identified with the design of bridges and industrial structures in California and Louisiana. He was for four years managing engineer for Waddell & Son, New York, and later was general manager and chief engineer in charge of design, estimating and production for the Bancroft-Jones Corporation, Buffalo.

—

Dr. J. M. Lohr, formerly in charge of melting for the Hoskins Mfg. Co., Detroit, and who later installed and managed the department of melting and hot rolling of nickel chromium and various other nickel alloys for the Electrical Alloy Co., Morristown, N. J., is now plant metallurgist for the Driver-Harris Co., Harrison, N. J. He received his doctor's degree from Cornell University and for many years has made an intensive study of the melting and manufacture of nickel and nickel-chromium alloys.

—

J. R. Allison, most recently identified with the construction department of the Homestead works, Carnegie Steel Co., has been appointed Pittsburgh district manager for the C. O. Bartlett & Snow Co., Cleveland, with headquarters at 406 Bessemer Building. He was graduated in mechanical engineering from the University of Pittsburgh and was first employed as field engineer for the Edgewater Steel Co., Pittsburgh. Later he was engaged in the mechanical department of the Pennsylvania Railroad, and during the war served as a first lieutenant in the engineers corps, United States Army.

—

William H. Page has resigned as head of the bureau of public relations of the American Institute of Steel Construction, New York, and has been succeeded by V. Gilmore Iden, most recently one of the editors of the *United States Daily*, Washington, and previously identified with the *Journal of Commerce*, New York, and the Penton Publishing Co., Cleveland. A. T. North has also resigned as head of the institute's bureau of architectural relations.

—

Howard C. Yost, most recently associated with the Lewis Bolt & Nut Co., Minneapolis, and previously in the metallurgical department of the Carnegie Steel Co., Pittsburgh, has become identified with the St. Paul, Minn., district sales office of the Inland Steel Co., Chicago.

—

W. Parker, director of sales for British Furnaces, Ltd., representative in Great Britain for the Surface Combustion Co., Toledo, Ohio, has been traveling in the United States during the last few weeks studying the new types of furnaces being used by various industries. He has given particular attention to the use of automatic heat control equipment and automatic furnaces used extensively in blast furnaces and steel mills, automotive plants and the chemical industry.

—

D. J. Hanna has been appointed district sales manager in Michigan for the Jessop Steel Co., Washington, Pa., and will have offices at 2208 Fort Street, Detroit.

—

J. E. McLain, who has been Pittsburgh district manager of sales for the Bethlehem Steel Co., has been appointed special representative in the Pittsburgh district, and will devote his attention to the company's larger accounts in the territory. His successor as Pittsburgh district manager of sales is James P. Kratzer, who has been assistant manager of sales in the bar department at the general offices of the company in Bethlehem, Pa. Mr. McLain has been identified with the steel industry since 1897, the year following his graduation from Princeton University, when he became an assistant to his father, then Pittsburgh district sales manager Cambria Steel Co., Johnstown, Pa. He succeeded his father upon the latter's retirement in 1911, and continued in the position when the company was acquired during the World War by the Midvale Steel & Ordnance Co., and was reappointed when the latter was absorbed by Bethlehem Steel Co. in 1923. Mr. Kratzer has been identified with the Bethlehem company since 1912, and except for a brief period in the open-hearth department in Bethlehem, has spent all of that time in the general sales department.

J. E. McLAIN

—

A. H. Deute, Borden Co., New York, has been made vice-president of the Billings & Spencer Co., Hartford, Conn., to succeed the late Arthur W. Fox.

—

Luke E. Fichthorn, president of the Peck, Stow & Wilcox Co., Southington, Conn., has resigned, and George S. Case, Lamson & Sessions Co., Cleveland, has been elected to succeed him. Mr. Fichthorn has been president of the Southington company since 1919. Charles F. Treadway, New Haven, Conn., a director of the company for several years, has been made treasurer.

—

Spencer Allen, associated for the past two years with the scrap department of the Cincinnati office of Hickman, Williams & Co., has resigned. Previously he had been connected with the company in its St. Louis office.

Gilbert S. Sank, formerly in charge of the Philadelphia office of E. Arthur Tutein, Inc., has become associated with Hickman, Williams & Co., Inc., at its Philadelphia office. Mr. Sank will specialize in coke, both domestic and foundry.

—

William G. Christy, for the past two years executive secretary of the Citizens' Smoke Abatement League, St. Louis, has tendered his resignation, effective July 1. As chairman of the St. Louis Section of the American Society of Mechanical Engineers, he was active in the organization of the league, which, under his direction, ran a campaign to raise $250,000 by popular subscription to carry out a three years' smoke abatement program. He was formerly superintendent of the St. Louis Boat & Engineering Co. and during the war was district manager of the United States Shipping Board. He will continue for the present to maintain his offices in the Railway Exchange Building, St. Louis, as mechanical engineer.

—

A. C. Kingston has been appointed assistant general manager in charge of sales of the Boston Woven Hose & Rubber Co., Boston, and also elected a member of the board of directors. J. W. Fellows, factory manager, has also been elected to the board.

—

Samuel A. Curry has been appointed superintendent of inspection and test at the South Philadelphia Works of the Westinghouse Electric & Mfg. Co., succeeding the late John T. Snyder. U. A. Taddiken, formerly in the condenser engineering department, has been named to succeed Mr. Curry.

—

Dr. Walter Cross has become associated with the Babcock & Wilcox Co., New York, as consulting chemical engineer. While his duties will necessitate his spending some time in New York, he will make his headquarters in Kansas City as heretofore.

—

Works Manager George N. Jeppson having been advanced to vice-president in charge of production, and Howard W. Dunbar to the position of works manager of the machine division of the Norton Co., Worcester, Mass., several other changes have been made in that organization. Hugo H. W. Beth has been made production manager of the wheel division and Dwight C. Daniels production manager of the machine division. Clarence R. King has been appointed consulting engineer and Duane E. Webster engineer of organic products, and Irving B. Loud has been assigned to the supervision of the silicate wheel department in addition to his other departments. W. La Coste Neilson, vice-president and general sales manager, announces these changes in the wheel division sales organization: Ralph M. Johnson, district manager at Hartford, Conn., made district manager at Philadelphia; W. Earle Shumway of the sales engineering department made manager of Connecticut district; H. K. Clark of the Chicago office made sales manager of the Deutche Norton Gesellschaft, the company's German subsidiary.

—

J. L. Jennings, vice-president and director of sales of the Lamson & Sessions Co., Cleveland, sailed May 31 for a two-months' trip to Europe.

—

Julius A. Dyblie, for many years chief engineer at the Joliet works, Illinois Steel Co., and associated with the company for 29 years, retired from active service on June 1. He was born in Norway 76 years ago, but has been in this country since 1879. During his long association with the steel industry he has been credited with the invention of many furnace devices, particularly a rotary reversing gas valve and an air check valve for blowing engines.

—

Charles P. Perin, Perin & Marshall, consulting engineers, New York, has returned from an extended trip to India, South Africa and Spain.

BACKED-UP STRIP ROLLS

Predicted That They Will Wholly Supplant Two-High Sets Now Common

STEEL mill engineers, operating officials and steel company executives took advantage, in large numbers, of an inspection tour under the auspices of the Association of Iron and Steel Electrical Engineers on Saturday, June 2, visiting the Salem, Ohio, works of E. W. Bliss Co. and seeing a new set of cold-rolling mills built by that company. They saw also a demonstration of cold-rolling by an electrically-driven cluster-type mill. More than 200 men interested in the cold-rolling mills and their product were present.

The mills are to be installed at the new plant of the Sharon Steel Hoop Co., and are expected to be in operation late next month or early in August. They comprise eight stands of cluster mills and 16 stands of two-high mills. These attracted much attention and there was much favorable comment on the clean grain surface of the roll housing castings.

At a gathering of the visitors in the auditorium of the Elks Club, J. H. Van Campen, chief engineer E. W. Bliss Co., read a paper: "General Characteristics of Cold-Rolling Mill Equipment." In this he pointed out the important features of the backed-up working roll mills, and described the mills and the auxiliary equipment later seen on the tour of the plant. He predicted that the mill in which small working rolls are backed up by larger rolls would one day supplant the two-high mill, now so commonly employed in cold rolling. He said that close grained cast iron housings reduce the springing tendency of the rolls, and that the use of anti-friction roller bearings eliminates the heating of roll necks and permits higher speed in rolling, while the use of universal spindles prevents back-lashing.

High Speed on Continuous Run

He mentioned the possibility of a speed of 375 ft. a minute on low-carbon steel on 16-in., 18-in. and 20-in. mills of four stands. The first mill would be used to take out irregularities in the strip and, in addition to making a light reduction, would deliver a constant supply to the other stands. On the second stand a reduction of 30 to 40 per cent was the objective and on the third stand one of from 25 to 30 per cent, with a fourth stand to be used for planishing and a reduction of about 10 per cent.

In the demonstration of the electrically-driven cluster-type mill, which followed the inspection of the mills for Sharon Steel Hoop Co., strips 15 in. wide by about 6 ft. long and 0.095 in. thick were successfully reduced in four passes to a thickness of 0.031 in. The reduction in the first pass was 30.9 per cent, in the second pass 25 per cent, in the third 23.4 per cent and in the final pass 13.8 per cent.

Among Those Present

Severn P. Ker, president Sharon Steel Hoop Co., who recently returned from a trip to Europe; T. P. Draper, vice-president and general manager of that company; James Lippincott, president and general manager, and Charles S. Todd, assistant to the president, West Leechburg Steel Co.; C. H. Hunt, chief engineer Weirton Steel Co.; Frank Flynn, assistant to the general manager Trumbull Works, Republic Iron & Steel Co., Warren, Ohio; and David Pride, superintendent Superior Steel Corporation, Carnegie, Pa., were among the interested spectators at the demonstration of the cluster-type mill.

Meeting of Blast Furnace and Coke Oven Association

B. F. Fairless, president Central Alloy Steel Corporation, Massillon, Ohio, will be the principal speaker at the summer meeting of the Eastern States Blast Furnace and Coke Oven Association to be held at the Edgewood Country Club, Edgewood, Pa., June 12. His subject will be "The Importance of Coke and Pig Iron in the Production of Quality Steel." At this meeting officers for the ensuing year will be elected.

OBITUARY

—

IRA HOBART SPENCER, founder and president of the Spencer Turbine Co., Hartford, Conn., whose recent death was mentioned in THE IRON AGE of May 10, was one of the country's leading authorities on blowers and exhausters and had more than 100 patents registered in his name. His interest in mechanics developed at an early age, and in 1892, at the age of 18 years, he constructed a water motor for use in pumping church organs. A number of these motors are still in use. In 1895 he organized the Spencer Motor Co., which later was sold to the L. E. Rhodes Co. and some time afterward became the Organ Power Co., maker of some of the first practical electrically operated organ blowers. In 1904, Mr. Spencer began experiments with stationary exhausters for cleaning buildings by the vacuum method, and in 1907 he organized the Spencer Turbine Cleaner Co. to exploit this cleaner. In 1918 this company was consolidated with the Organ Power Co. as the Spencer Turbine Co., with Mr. Spencer as president. He continued his experimentations with air machines and produced the line of Spencer turbo-compressors used for operating oil and gas-fired furnaces and ovens and for cupolas.

IRA H. SPENCER

—

EDWARD ALLEN WHITWORTH, formerly general superintendent of the Bourne-Fuller Co., Cleveland, and widely known in the steel making industry, died suddenly at his home in Buffalo, May 31. For some time he had been prominently identified with the organization of open-hearth superintendents and for two years had served as chairman of this organization, which holds conferences to discuss open-hearth problems as an extension of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers. Mr. Whitworth was connected with the Bourne-Fuller Co. about eight years, first as open-hearth superintendent, and later as general superintendent. On leaving the Bourne-Fuller Co. in 1925 he became affiliated with the Gathmann Engineering Co., Baltimore. At the time of his death he was connected with the Federal Concrete Co., in Buffalo, where he had made his home for several months. He was 45 years of age and had graduated from Pennsylvania State College in 1904.

—

MICHAEL ROSENBERG, president Rosenberg Iron & Metal Co., Chicago, dealer in scrap metals, died May 31.

—

FRANK L. WELLS, president and treasurer Frank L. Wells Mfg. Co., Kenosha, Wis., died Monday, May 28, after a brief illness. He was widely known in machinery and general manufacturing circles.

—

JOHN SEYMOUR BYCROFT, SR., in charge of purchases for the Stewart Furnace Co., Sharon, Pa., died suddenly June 1, aged 65 years. He had been associated for 30 years with the Stewart company.

—

MAURICE N. LANDAY, president M. N. Landay Co., Pittsburgh, dealer in scrap iron and steel, died at his home in that city May 31. He was born in Washington, Pa., 42 years ago and attended Washington and Jefferson College. For many years he had been Pittsburgh representative of the Hyman, Michaels Co., Chicago, and when that company discontinued its Pittsburgh office he organized his own company, which became the Pittsburgh representative of the Hyman, Michaels Co. and of the Perry-Buxton-Doane Co., Boston.

—

JACOB TRAUTMAN, Pacific Coast manager for the Colonial Steel Co., Pittsburgh, and for several years general sales manager of that company, died at Los Angeles June 2. He was born in Pittsburgh 53 years ago, and had been identified with the Colonial company for 35 years, all of that time in the sales department. He had been an active member of the Pittsburgh chapter of the American Society for Steel Treating.

—

ALFRED G. SMITH, president and formerly general manager of the American Shipbuilding Co., Cleveland, a leading shipbuilder on the Great Lakes, died June 5, after a four months' illness, aged 53 years.

Detroit Iron and Steel Market

(*Concluded from page* 1646)

8361 cars, which is 279 units greater than April figure, and considerably greater than the 3516 units built in May, 1927. Hupp production during the first five months of this year was also a record, totaling 33,313 units, compared with 19,431 units in 1927, an increase of 13,882, or 71 per cent. It is reported that Hupp goes into June with 2180 unfilled orders.

Packard built 4782 cars in May, an increase of 2681, or 127 per cent, over the May, 1927, figure, and 348 units above the April output. The first nine months of Packard's fiscal year show a production of 33,930 units, compared with 24,265 units for the same period in the previous fiscal year, an increase of 9665, or about 40 per cent.

The Reo Motor Car Co. developed a new high record in May, with a production of 6121 units, or an increase of 576 units over that of May, 1927, and an increase of 844 units over the output of April, this year, and had 6400 unfilled orders on June 1.

Ford production is still increasing. During the week ended May 23 employment by the Ford Motor Co. totaled 112,683 men, a record at that time in the history of the company. The previous peak occurred in 1926, with 110,000 men at work. Figures on Ford employment released June 1 showed an addition of 2748 men, bringing present operating strength to 115,431 men, of whom 77,924 are working at Fordson, 32,795 at Highland Park and the remaining 4712 at the Lincoln plant. Production on the Ford Fordor sedan was started about 10 days ago. Thus far, the Ford Co. of Canada has produced somewhat in excess of 12,000 model A cars, and output at present runs about 325 cars a day, or 66 per cent of capacity.

The Willys-Overland plant is maintaining peak production, shipments of 11,583 units establishing a new weekly figure. The previous high mark for a week was 10,850 cars. The company is reported to have about 30,000 unfilled orders on the books. Employment at the Toledo plants continues at 22,000 men.

The Lakey Foundry & Machine Co. has received a contract for cylinder castings amounting approximately to $700,000. This, with other recent orders, is expected to double the output of the plant for the fiscal year ending Oct. 31.

Shipments for the first 15 days of May by the Hayes Body Corporation totaled approximately $1,400,000 worth of product, compared with $815,000 worth during the like period of 1927. Production now stands at about 800 bodies a day.

Rate on Non-Ferrous Scrap from Texas to St. Louis Upheld

Affirming a previous decision, the Interstate Commerce Commission, upon reconsideration of a complaint of the Southern Metal Co., in a recent opinion, held that the carload rate of 66.5c. per 100 lb. on non-ferrous scrap metals from Beaumont, Galveston and Houston, Tex., to St. Louis, is not unreasonable. It held that the rate is unduly prejudicial in certain instances.

European Prices Continue to Advance

German Consumers Oppose High Domestic Market to Aid Export—British Mills Discuss Central Selling Agency

(*By Cable*)

LONDON, ENGLAND, June 4.

CLEVELAND pig iron is still quiet, but makers are well booked and prices are being maintained. The hematite market is dull and values have an easy tendency, as unsold stocks at furnaces are still large. Foreign ore is quiet and consumers are well covered.

Finished steel mills are resuming after the holidays with only a few orders for heavy material. Negotiations for the formation of a central selling agency for steel have been resumed, but the outcome is uncertain as there is little unanimity among makers. It is understood, however, that arrangements may be made to combine in competing for large orders in certain overseas markets.

Welsh tin plate bar makers have raised the official price to £6 ($29.22) per ton delivered and some sellers are not inclined to enter into forward contracts because of the uncertain scrap situation. Foreign sheet bars are offered at £5 10s. ($26.79) per ton delivered, but buyers prefer the Welsh product. Tin plate is firm as a result of the steel situation and a good general demand.

Galvanized sheets are quiet but prices are steady because of increased foreign steel costs. There is a good demand for black sheets from the Far East in both heavy and light gages. Japanese specification thin gage sheets have been advanced.

Clyde shipbuilding in May totaled 28 vessels of 49,500 tons.

The Continental market is quiet in trade with British buyers, but prices are generally maintained. In Belgium 55 furnaces were in blast on April 30. Production in April was 313,300 tons of pig iron and 295,700 tons of steel ingots. April production in Luxemburg was 227,000 tons of pig iron and 202,600 tons of steel ingots. The Polish output in March was 58,000 tons of pig iron, 118,200 tons of steel ingots and 91,000 tons of rolled products.

German Steel Prices Unchanged—Good Machinery Trade

(*By Radio*)

BERLIN, GERMANY, June 4.

ALL syndicate prices for May have been retained for June. The domestic steel market is weaker and production is declining, but the syndicates report satisfactory business to be assured for the coming two and a half months.

The pig iron market is quiet. Foundries report an increasing volume of orders. Export trade is continuing to improve and prices are firm, particularly in bars, bands, heavy and light gage sheets and wire. Export activity in wire rods and tubes has decreased. Domestic prices on all wire products have been raised by 15 m. ($3.59) per ton.

The domestic machinery market is satisfactory, except in textile machines. All home prices of machinery have been raised as a result of the rise in steel prices last month. Foreign orders for textile and paper-making machinery are increasing.

Steel Cartel Fines Represent Small Loss

HAMBURG, GERMANY, May 12.—The advantage of penalty payments in the International Steel Cartel has been discussed recently in the steel industry. In the past quarter French mills, for the first time since organization of the cartel, exceeded their allotment by 12,000 tons. Austria, Luxemburg and the Saar, which have been below the full quota in the past, also exceeded their allotments. All members are fined for overproduction but, after refunding by the cartel, have only slightly less than they have paid in to the treasury. Germany, for example, receives about 97c. of every dollar paid and other countries receive 93c. to $1.11 for each dollar. With the total financial advantage or disadvantage so small, it is argued that fines

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	17¾s.				$4.33	
Bilbao Rubio ore*..	1	2½				5.48	
Cleveland No. 1 fdy.	3	8½				16.56	
Cleveland No. 3 fdy.	3	6				16.07	
Cleveland No. 4 fdy.	3	5				15.83	
Cleveland No. 4 forge	3	4½				15.71	
Cleveland basic (nom.)	3	5				15.83	
East Coast mixed...	3	9	to	£3	10s.	16.81	to $17.05
East Coast hematite.	3	10½				17.17	
Rails, 60 lb. and up.	7	15	to	8	0	37.75	to 38.96
Billets	6	5	to	6	10	30.44	to 31.66
Ferromanganese ...	13	15				66.97	
Ferromanganese (export)	13	0	to	13	5	63.31	to 64.53
Sheet and tin plate bars, Welsh	6	0				29.22	
Tin plate, base box.	0	18¼	to	0	18⅓	4.45	to 5.02
Black sheets, Japanese specifications.	13	7½				65.14	
						C. per Lb.	
Ship plates	7	12½	to	8	2½	1.66	to 1.77
Boiler plates	9	0	to	10	10	1.95	to 2.28
Tees	8	2½	to	8	12½	1.77	to 1.99
Channels	7	7½	to	7	17½	1.60	to 1.71
Beams	7	2½	to	7	12½	1.55	to 1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to 1.69
Steel hoops	9	0	to	10	0	1.95	to 2.17
Black sheets, 24 gage	9	15	to	9	17½	2.12	to 2.14
Galv. sheets, 24 gage	13	5				2.88	
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to 3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):								
Belgium	£3	3s.	to	£3	5s.	$15.34	to	$15.83
France	3	3	to	3	5	15.34	to	15.83
Luxemburg	3	3	to	3	5	15.34	to	15.83
Basic pig iron (nom.)								
Belgium	3	0	to	£3	1s.	14.61	to	$14.85
France	3	0	to	3	1	14.61	to	14.85
Luxemburg	3	0	to	3	1	14.61	to	14.85
Coke	0	18				4.39		
Billets:								
Belgium	4	15				23.14		
France	4	15				23.14		
Merchant bars:						C. per Lb.		
Belgium	5	15	to	5	17½	1.27	to	1.29
France	5	15	to	5	17½	1.27	to	1.29
Luxemburg	5	15	to	5	17½	1.27	to	1.29
Joists (beams):								
Belgium	4	18½	to	5	0	1.08	to	1.10
France	4	18½	to	5	0	1.08	to	1.10
Luxemburg	4	18½	to	5	0	1.08	to	1.10
Angles:								
Belgium	5	10	to	5	12½	1.21	to	1.23
⅛-in. plate:								
Belgium (a)	6	12½				1.45		
Germany (a)	6	12½				1.45		
⅜-in. ship plate:								
Belgium	6	9				1.42		
Luxemburg	6	9				1.42		
Sheets, heavy:								
Belgium	6	1				1.34		
Germany	6	1				1.34		

(a) Nominal.

are not particularly effective, and it is further pointed out that, despite the penalties exacted for overproduction since formation of the cartel, production has continued at apparently as high a level as possible in the individual countries which are members.

GERMAN COSTS INCREASING

Wages, Freight Rates and Unemployment Insurance Are Factors—Arbitration Law Opposed

HAMBURG, GERMANY, May 19.—Steel mills report that considerable difficulty is being encountered in the introduction of the three-shift schedule, or 8-hr. day, which the Government has ordered to be in effect within six months after Jan. 1 of this year. They claim that production costs have been greatly increased, Thomas steel producers being forced to increase the number of their workmen by 15 to 20 per cent and open-hearth plants by 10 to 15 per cent.

Costs are estimated to have increased 12m. ($2.87) per ton since March, 1927. Since then, there have been increases in wages, overtime pay, unemployment insurance costs, railroad freight rates and water transportation rates on the Rhine. Still further increases are expected if shorter working days are introduced at blast furnaces, sheet mills and wire mills in the next two months.

The recent rise in domestic prices on steel, averaging 3 to 7m. (72c. to $1.67) per ton, was necessary, according to the steel producers to offset losses on the 40 per cent of their production that is exported. Further increases in costs of production and distribution, however, cannot be passed on to the consumer, as prices are now practically as high as in Great Britain. World market prices are at a high level today, but, should there be a decline in export quotations, German mills, with additional costs of production, would be at a decided disadvantage.

This situation has resulted in a demand from the steel industry, which is supported by the machinery builders and non-ferrous metal producers, that compulsory arbitration be abandoned. It is claimed that immediate losses by strikes and lockouts would be preferable to the loss of trade over a long period through inability to meet competition.

GERMANS OPPOSE PRICE RISE

Consumers Object to Paying High Prices to Aid Export—Elimination of Tariff Suggested

BERLIN, GERMANY, May 19.—Announcement has been made by the Minister of Industry that the controversy over the recent increase in prices by the steel syndicate will be considered by the cabinet immediately following the general election May 20. The advance of 3 to 7m. (72c. to $1.67) in domestic prices of steel has resulted in considerable opposition from consumers and the liberal press. The Frankfurter *Zeitung* has characterized the domestic syndicate system as a ruthless monopoly, under which the domestic consumer bears the losses suffered by the mills as a result of selling for export to enable them to avoid reducing their production quotas.

The opposition to the price increase is also directed toward the International Steel Cartel. It is pointed out that the purpose of Germany's participation in the cartel originally was to aid in bringing the level of world market prices up to the domestic market. In general, however, the difference in prices quoted in these two markets has increased. The producers of steel argue that their costs have advanced since entry into the cartel because of the heavy fines they have been forced to pay for overproduction.

Some consumers are urging the complete abolition of import duties on steel, to compel German mills to sell in their home market at the world market level. The present duties are as follows: Ingots, 10 m. ($2.39) per ton; blooms, 10 m. ($2.39); billets, 15 m. ($3.59); slabs, 15 m. ($3.59); structural shapes, bars, bands and wire rods, 25 m. ($5.98); heavy sheets, 55 m. ($13.16).

In support of their present price policy, steel producers point out that the latest rise in coal prices increased production costs of steel 4 to 7 m. (96c. to $1.67) per metric ton. On semi-finished products, it is claimed, production costs have advanced 7.25 m. ($1.73) per ton, on steel bars 5 m. ($1.19) per ton, on bands 9.66 m. ($2.32), on structural shapes 4.65 m. ($1.11), and on heavy sheets 10 m. ($2.39). Using steel bars as an example, the mills claim that the average export price has declined since last December from 121 m. ($28.95) per ton to 119 m. ($28.48), but that it costs 125 m. ($29.91) per ton to produce bars, even in the most modern mills. Furthermore, this does not include the cost of price rebates to exporting manufacturers or penalties for overproduction exacted by the International Steel Cartel.

Price rebates to exporting manufacturers are becoming an increasing burden to the mills, as the exports of finished products, on which such rebates are paid, are rapidly increasing. These rebates in May are: blooms, billets and slabs, 19 m. ($4.54) per ton; structural shapes, 35 m. ($8.36); bars, 28 m. ($6.70); bands, 35 m. ($8.36); wire rods, 21.50 m. ($5.14), and heavy sheets, 22 m. ($5.26). These rebates are less than at the end of last year, as a result of the advance in world market prices, but, unless export prices show a further increase, larger rebates will be paid next month because of the advance in the domestic market.

JAPANESE MARKET UNSETTLED

Prices Show Tendency to Advance Despite Political Conditions—Tin Plate Output Higher

Uncertainty of the political situation continues to exercise a depressing effect on business, says the report for April of A. Cameron & Co., Kobe, Japan. There is discussion of a second dissolution of the House of Representatives. Prices of various commodities, however, have shown a decided tendency to advance during the past month. The yen weakened considerably in foreign exchange under pressure from New York and Shanghai, as a result of the unstable political situation in China and the dispatch of Japanese troops to the war zone. The Fifteenth Bank has reopened and the money market is weak, showing signs of a further decline. There are reports that the gold embargo will be abolished soon, but the foremost financial authorities consider a return to a gold basis unsafe unless special arrangements have been granted by the Bank of Japan for recovery of its readjustments with the closed banks.

Flotation of a large loan for the Tokio Electric Light Co. is in prospect. A good sign is the gradual reduction of the large excess of imports in the past few years. The total of Japanese credit and capital invested in foreign countries at present is estimated at Y. 2,138,000,000, exclusive of private investments. Against this is the debt of the Japanese Government and private companies to foreign countries, including foreign capital invested in Japan, given as Y. 2,131,000,000, which shows an actual credit balance in Japan's favor. Japanese loans and investments in China total Y. 1,112,000,000, and these are yielding no interest or profit at present. About the only profitable investments in China are in the spinning plants.

During March, says the report, imports of black sheets totaled 19,951 tons, of which 9927 tons came from the United States, 8546 tons from Great Britain, 1322 from Germany and 156 tons from Belgium. This total exceeded the February imports by 8200 tons. The Kawasaki Dockyard Co. reduced its selling prices on black sheets by about Y. 5 ($2.34) per ton to meet the threatened competition from foreign mills, and this was followed by an advance of Y. 2 (94c.) per ton later in April when the yen began to decline. The market is at present overstocked with large supplies of sheets purchased when it was believed that the tariff might be increased.

Imports of tin plate last year were larger than in 1925 or 1926, but, with a continued increase in the tin plate output of the Government works, the total for this year is not expected to be so large. The following

shows the imports and the production of the Government works in metric tons for the past five years:

	Government Works	Imports
1923	795	55,343
1924	4,850	71,434
1925	7,037	58,367
1926	11,366	49,995
1927	14,390	61,051

Improvement in the wire rod market, which began in March, has continued, and prices have advanced, about the middle of the month reaching Y. 98 ($45.82) per ton and at the end of April Y. 102 ($47.69) per ton. However, replacement prices of German wire rods are Y. 92.50 ($43.24) per ton and of American Y. 94.50 ($44.18) per ton.

STEEL IMPORTS DECLINE

Continental Prices Too High to Interest Consumers Here—Japan Inquires for Gas Pipe

NEW YORK, June 5.—The volume of business being done by importers of steel in New York is rapidly diminishing as the Continental steel market continues to rise. Steel bars have reached a prohibitive level, following a further advance last week which brought the delivered price, Atlantic port, to 1.90c. per lb., duty paid, for Thomas grade. On this basis, open-hearth steel bars would be 2c. per lb., duty paid, or about 2.10c. per lb., delivered to the local consumer from the dock, representing a saving from the domestic price on the basis of 1.80c. per lb., Pittsburgh, of less than $1 per ton. Steel hoops and bands are at the domestic level, representing no saving to the consumer here, and on some sizes of hot-rolled strip steel the European delivered price is only about 80c. a ton less than the delivered price from American mills.

Structural shapes of Thomas grade are quoted at about 1.80c. per lb., duty paid, which is still a small reduction from the domestic market level, but deliveries on all Continental steel products are rather extended, ranging from three to four months in most cases, so that it is difficult to do business. A fair tonnage of Continental steel continues to arrive on old orders placed with foreign mills prior to the recent price advances, but only a small tonnage of new business is being placed for future delivery, importers not being inclined to risk a possible decline in the European market, which might result in cancellation of orders by their customers here.

Export business continues quiet. Japanese demand is confined to small lots of special materials, with the exception of an occasional inquiry from a large consumer. The Tokio Gas Co. is in the market for about 900,000 ft. of ¾-in. and 75,000 ft. of ½-in. black gas pipe. Recent sales to the Far East have included about 5600 boxes of odd-sized tin plate to a consumer in Takow, Formosa, as well as some small tin plate orders from China.

German Freight Rates on Copper Reduced

HAMBURG, GERMANY, May 19.—The freight rates on imported copper from German frontier points or ports to Danube River ports have been reduced by the German Railroad Directory. The reduced rates will be effective for nine months. It is believed that this will serve to increase the sale of American copper to Austria, Hungary, Jugoslavia and Czechoslovakia by way of Germany.

Sheets of various standard and special types, including monel metal sheets in different finishes, a complete line of sheet metal forming and fabricating equipment and various supplies used by the sheet metal contractors were exhibited by the J. M. & L. A. Osborn Co., Cleveland, at a sheet metal show held at its plant in conjunction with the joint convention of the National Association of Sheet Metal Contractors and the Ohio Sheet Metal Contractors' Association held in Cleveland May 22-25.

FRENCH STEEL TRADE GOOD

Domestic Market Active and Foreign Projects Promise Future Business—Prices Advancing

PARIS, FRANCE, May 18.—Business is satisfactory, and the revival of buying expected as a result of the elections is beginning to develop. Large consumers are buying, no longer expecting a recession of prices. In addition, there are important public projects in course of execution in the East and in South America, for which bridge and building materials, rails and rolling stock will be required. Recently it was decided by the French railroads that all freight cars should be equipped with continuous brakes.

This flow of new business is favorably influencing the market, and deliveries are becoming more extended. Mills show no inclination to commit themselves for distant shipment.

Pig Iron.—Producers of pig iron met last week and decided to make no change in the tonnage and prices for June. A total of 38,000 tons of phosphoric foundry iron and 40,000 tons of hematite iron will be available to domestic consumers in June. Negotiations for formation of an association of hematite iron producers are continuing and a successful conclusion is expected.

Semi-Finished Material.—The comptoir controlling semi-finished material and beams has decided to make no change in prices. Most French consumers are fairly well covered. Blooms range from £4 4s. to £4 12s. 6d. ($20.46 to $22.53) per metric ton, billets from £4 12s. to £4 15s. 6d. ($22.41 to $23.26) per ton, and sheet bars from £4 16s. to £4 17s. ($23.38 to $23.63) per ton, f.o.b. Antwerp.

Finished Material.—Except on beams, prices are higher. Most French consumers of beams built up sizable stocks early in the year, when prices were lower, and are not seeking supplies at present. For export, beams are quoted at £4 16s. to £4 16s. 6d. per ton (1.06c. to 1.07c. per lb.), f.o.b. Antwerp. Steel bar prices continue to advance in both the domestic and export markets. Sheet prices are firm, with the market active. Boiler plates have been advanced in the domestic field, and some mills are quoting deliveries up to three months.

Foreign Trade.—Imports of iron and steel in March totaled 14,712 metric tons, compared with 8295 tons in February. Exports were 382,131 tons in March and 422,160 tons in February. Imports of iron and steel scrap were only 2225 tons in March and 1471 tons in February, but exports totaled 39,950 tons in March and 32,610 tons in February. The largest exports were in semi-finished products, shapes and bars, totaling 242,351 tons in March, while shipments of pig iron were only 57,534 tons.

American Lock Maker Reported to Have Bought German Company

HAMBURG, GERMANY, May 12.—The Yale & Towne Mfg. Co., Stamford, Conn., which recently acquired Damm & Ludwig, Velbert, Germany, is reported to have purchased Boge & Kastens, another large German lock manufacturer. Negotiations are reported for acquisition by the Yale & Towne Mfg. Co. of a third German lock company.

Boge & Kastens are large exporters of door locks and with Damm & Ludwig formerly produced about 88 per cent of the total German output of locks. Apparently the new ownership plans no expansion of production, as it is reported that, after May 10, these plants will operate only three days a week, although other German lock manufacturers are on a full six-day week. It is suggested in the German hardware trade that the purpose of buying these companies was to eliminate competitors, and it is pointed out that the largest German hinge and strap producer, Carl vom Bruck, Velbert, is now the property of the Stanley Works of New Britain, Conn.

Machinery Markets and News of the Works

MAY BUYING DECLINED

Machine Tool Orders Generally Fell Off—June Prospects Good

Chicago Market Is the Most Active—Deere & Co. Placing Large Orders Against Recent Inquiry

MACHINE tool buying declined in May from the April volume, but a good deal of business is pending, so that prospects for June appear fairly promising. The outstanding activity is at Chicago, where orders have been placed by Deere & Co., manufacturers of agricultural implements, against a recent large inquiry. Further purchasing of tools by the J. I. Case Threshing Machine Co. and the Monarch tractor plant of the Allis-Chalmers Mfg. Co. will probably come soon.

The General Electric Co., Schenectady, N. Y., has issued additional inquiries for about 20 tools, bringing its list of pending requirements up to nearly 40 items. Most of this equipment is to be bought for its electric refrigeration department.

Automobile manufacturers have made scattered purchases, but in the aggregate they constitute only a small part of current machine tool buying.

Railroad inquiry is usually limited to single machines. At Chicago, purchases are still to be made by the Santa Fe against recent inquiries. Orders are expected at Boston from the Boston & Albany, Boston & Maine and New York, New Haven & Hartford railroads. Few of the recent inquiries of the New York Central have developed into purchases.

An export order totaling about $50,000 for a European country has been booked by a Cincinnati company.

New York

NEW YORK, June 5.

MACHINE tool sales in this territory in May fell off considerably from the April volume, not less than 10 or 15 per cent in most cases and as much as 40 or 50 per cent in a few instances. However, the amount of business pending, plus the day-to-day inquiries, gives promise that June business may exceed that of last month. Additional inquiries have been sent out by the General Electric Co. for about 20 machines, making a total of close to 40 that this company may buy within the near future. The week's sales included seven 13 x 30-in. lathes and two 16 x 36-in. lathes to one company and two 13 x 30-in. lathes to another company; two 14-in. vertical surface grinders to one company and two No. 2 Pratt & Whitney die sinkers to another. A manufacturer bought four Ransom No. 43 grinders. Some makers of grinders and multiple spindle drilling machines have announced an advance in prices of about 10 per cent.

Yonkers Electric Light & Power Co., Yonkers, N. Y., has filed plans for a four-story equipment storage and distributing plant addition with repair shop, including improvements in present unit on adjoining site, to cost about $200,000.

Abraham Baxter, 638 Coster Street, New York, plumbing and heating equipment, has plans for a one-story factory, 50 x 100 ft., to cost about $28,000 with equipment. S. F. Oppenheim, Inc., 156 East Forty-second Street, is architect.

William Shary, 41 Union Square, New York, architect, will soon take bids for a two-story automobile service, repair and garage building, 115 x 150 ft., at Corona, L. I., to cost close to $100,000 with equipment.

New York Edison Co., Irving Place and Fifteenth Street, New York, has plans for an addition to power station at 151-53 East Thirty-ninth Street, 81 x 138 ft., to cost in excess of $300,000 with equipment.

Automatic Musical Instrument Co., 15 East Fortieth Street, New York, manufacturer of coin-operated musical instruments, is disposing of stock issue to total $960,000, a portion of proceeds to be used for expansion, including manufacture of recently perfected selective automatic talking machine and parts.

American Smelting & Refining Co., 120 Broadway, New York, has acquired controlling interest in Silver Reef Mines Co., with properties in Utah. New owner plans extensive development and installation of additional equipment. H. A. Guess, vice-president of purchasing company, will be president of Silver Reef organization.

Charles Schaefer, Jr., 332 East 149th Street, New York, architect, has plans for two-story automobile service, repair and garage building, 100 x 100 ft., to cost approximately $100,000 with equipment.

A. J. Kolonics, 3 Knickerbocker Avenue, Brooklyn, manufacturer of harness and kindred products, metal trimmings, etc., has filed plans for new one-story plant, 75 x 105 ft., to cost about $22,000. Louis Berger & Co., 1701 Myrtle Avenue, are architects.

Board of Education, Ossining, N. Y., has engaged J. G. Rogers, 156 East Forty-first Street, New York, architect, to prepare plans for new high school with manual training facilities, to cost $750,000.

Franz Wolfgang, 535 East Tremont Avenue, New York, architect, is completing plans for a two-story automobile service, repair and garage building, to cost $100,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, will receive bids until June 20 for ice-making and refrigerating equipment for naval air station, Lakehurst, N. J., Specification 5423.

Newark Compressed Steel Corporation, 457 Peshine Avenue, Newark, has filed plans for one-story addition, 31 x 50 ft. P. D. Ackerman is architect.

F. L. Smidth & Co., North Avenue, Elizabeth, N. J., engineers for cement mills, etc., operating Smidth's Foundry, Inc., same location, have plans for one-story foundry addition, 20 x 50 ft., and extension in crane runway. Bids will be asked soon. Headquarters are at 50 Church Street, New York.

Carrier Engineering Co., 750 Frelinghuysen Avenue, Newark, manufacturer of air conditioning machinery, has purchased former plant of General Electric Co., at Frelinghuysen and Evergreen Avenues, comprising four-story structure with 110,000 sq. ft. floor space on 6½-acre tract. Purchasing company will continue present factory and will use purchased plant for expansion.

Bayonne Bolt & Nut Corporation, Trask Avenue and Second Street, Bayonne, N. J., is reported planning early rebuilding of portion of plant destroyed by fire several weeks ago, with loss in excess of $75,000 including equipment.

Goodwin-Pray, Inc., 102 Murray Street, Newark, manufacturer of electrical products, with electrical repair works, has acquired two-story factory at 290-92 Chestnut Street, 50 x 151 ft., and will remove present works to new location and increase capacity.

The duPont Viscoloid Co., Arlington, N. J., subsidiary of E. I. duPont de Nemours & Co., Wilmington, Del., will

rebuild portion of plant destroyed by fire June 1, with loss in excess of $50,000 with equipment, tanks, etc.

Public Service Electric & Gas Co., Public Service Terminal, Newark, is said to be completing plans for two-story equipment storage and distributing plant, with automobile service and garage building, at West New York, N. J., to cost close to $200,000 with equipment.

Equipment at plant of E. V. Hartford, Inc. (Hartford Shock Absorber Co.), Carbon Place, Jersey City, will be sold at auction on June 26 and 27 by Industrial Plants Corporation, New York. Company formerly manufactured shock absorbers and wheel shimmy eliminators. Sale includes power presses, lathes, milling machines, grinders, drill presses, shapers, motors, screw machines, tappers, office furniture and equipment, tools and fixtures.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, has awarded contract for additions to its plant at Mechanicville, N. Y., to cost more than $500,000. Morton C. Tuttle Co., Boston is engineer and builder.

Contract for a $50,000 addition to sheet metal department of John Waldron Co., New Brunswick, N. J., has been awarded to H. K. Ferguson Co., Cleveland. It will be one story, with 20,000 sq. ft. of floor space and, with equipment, will cost about $75,000. A mono-rail crane will be installed.

Chicago

CHICAGO, June 4.

ORDERS released the last week in May against the list of Deere & Co., enlarged many dealers' books so that sales last month dropped only slightly below the total in April. Prospects for June appear favorable. The Santa Fe list is still only partly covered and Deere & Co. are placing new orders daily. The Allis-Chalmers Mfg. Co., Milwaukee, is in need of additional machine-tools for its Monarch tractor plant at Springfield, Ill. It is also probable that the remaining items on the list of the J. I. Case Threshing Machine Co., Racine, Wis., will be purchased this month.

Machine-tool inquiries of the Rock Island Railroad are still open. The Burlington is asking for a 30-in. x 14-ft. motor-driven engine lathe. The General Electric Co., Chicago, will buy a 72-in. vertical boring mill, a 48-in. x 18-ft. lathe and a 36 x 36 x 8-ft. open-side planer. A fair number of used tools is moving from dealers' floors.

Work will soon begin on two-story addition, 40 x 120 ft., to plant of Ingersoll Milling Machine Co., Rockford, Ill., for which general contract has been let to E. W. Schmeling & Sons, 1031 School Street, to cost close to $50,000 with equipment. A. G. Eliel, Stewart Building, is architect.

Huguelet Brothers, 908 North Huguelet Place, Chicago, have awarded general contract to Schmidt Brothers Construction Co., 22 East Huron Street, for four-story automobile service, repair and garage building, to cost $160,000 with equipment. Schmidt, Garden & Erickson, 104 South Michigan Avenue, are architects.

Great Northern Railway Co., St. Paul, Minn., is understood to be planning early call for bids for equipment for new engine house addition and shop, with power plant at Fargo, N. D. Work on superstructure has been begun. Entire project is reported to cost in excess of $90,000. T. D. McMahon is company architect.

Minnesota Power & Light Co., 30 West Superior Street, Duluth, Minn., will soon take bids on general contract for a new two-story equipment storage and distributing plant, to cost $140,000 with equipment.

Adams Co., 111 West Sixth Street, Dubuque, Iowa, manufacturer of milling machines and other machine-tools, has filed plans for a one-story addition to machine shop and foundry, to cost more than $40,000 with equipment.

Fairmont Railway Motors, Inc., Fairmont, Minn., manufacturer of railroad equipment, has merged with Mudge & Co., 80 East Jackson Boulevard, Chicago, manufacturer of kindred products. Consolidated organization will operate under first noted name; both plants will be continued in service and an expansion program carried out. New company will have capital of $400,000 and surplus of $650,000. H. E. Wade, president of Fairmont company, will be chairman of board of consolidated organization.

Public Service Co. of Colorado, Denver, Colo., in conjunction with Prairie Oil & Gas Co., Independence, Kan., and other interests, has plans for new gas compressor plant in vicinity of Devine, Colo., to cost more than $400,000 with equipment.

Des Moines Casket Co., 405 S. W. Eighth Street, Des Moines, Iowa, has plans for new two-story plant, 100 x 150 ft., to cost more than $45,000 with equipment.

West End Scrap Iron & Metal Co., 1920 West Michigan Street, Duluth, Minn., has plans for a two-story storage and distributing plant, to cost about $32,000 with equipment. Thomas J. Shefchik, Glencoe Building, is architect.

Blackhawk Foundry & Machine Co., Davenport, Iowa, has awarded general contract for one-story foundry addition, 42 x 90 ft., to Priester Construction Co., Davenport, to cost about $20,000 with equipment.

Midway Foundry Co., St. Paul, Minn., is completing an addition, 75 x 100 ft., which will increase output about 100 per cent.

Joseph J. Kovar Co., Owatonna, Minn., has been incorporated with capital stock of $200,000 to manufacture agricultural tools and equipment, continuing line of products manufactured by Joseph J. Kovar and successors for 14 years. Company has factory and necessary equipment.

Burgess Battery Co., 111 West Monroe Street, Chicago, maker of sound absorbing ceilings and sidings, has changed its name to C. F. Burgess Laboratories, Inc., and removed offices to Madison, Wis.

Lewis Signal & Alarm Corporation, 207 Commerce Building, Sioux City, Iowa, has been organized to manufacture burglar alarm equipment. Operations are being carried on in company's own shop and necessary equipment has been purchased, but it is in market from time to time for 14 to 20-gage black sheets, electrical wire, relays, gongs, batteries and other kindred equipment.

Philadelphia

PHILADELPHIA, June 4.

PLANS are being completed by Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia, manufacturer of mechanical drying equipment, air conditioning apparatus, etc., for a two-story and basement addition, 50 x 146 ft., to cost in excess of $65,000 with equipment. Day & Zimmermann, Inc., 1600 Walnut Street, is engineer.

Architectural Steel Engineering Co., Philadelphia, has been formed with capital of $50,000 to take over and expand company of same name with plant at 1512-20 North Thirteenth Street, and will develop facilities for production of structural steel and ornamental iron products. Daniel Boyle and Joseph M. Thomas are heads.

York Ice Machinery Co., Belmont and Thompson Streets, Philadelphia, manufacturer of ice-making and refrigerating machinery, has asked bids on general contract for an addition, to cost more than $60,000 with equipment.

Philadelphia Coke Co., Richmond Street, near Orthodox Street, Philadelphia, an interest of Koppers Co., Pittsburgh, has taken out a permit for two two-story units to cost about $500,000.

Eugene A. Stopper, 10 South Eighteenth Street, Philadelphia, architect, has awarded general contract to Golder Construction Co., 1600 Arch Street, for two-story factory, 60 x 275 ft., to cost close to $80,000, to be occupied under lease by Welsbach Street Lighting Co. of America, Twentieth and Arch Streets, manufacturer and operator of gas-lighting equipment.

Pennsylvania Railroad Co., Philadelphia, has awarded general contract to Sinclair & Grigg, Sixteenth and Walnut Streets, for one-story and basement storage and distributing building, 90 x 460 ft., with elevating, conveying and other mechanical handling equipment, to cost about $390,000. William Cookman is company architect.

Vacuum Oil Co., 61 Broadway, New York, has awarded general contract to White Construction Co., Jefferson Building, Philadelphia, for two-story and basement addition to refinery at Paulsboro, N. J., 122 x 225 ft., with one-story extension, 31 x 46 ft., and wing addition, 32 x 40 ft., to cost in excess of $125,000. Portion will be used as a can factory, and for storage and distributing service.

Joint school boards of Westgrove, Avondale and Londongrove townships, Pa., C. E. Patton, Westgrove, chairman of building commission, plans installation of manual training equipment in new senior and junior high school to be erected between Westgrove and Avondale, to cost $250,000, for which bids have been asked on general contract. E. W. Martin, duPont Building, Wilmington, Del., is architect.

Pennsylvania Power & Light Co., Allentown, Pa., has applied for permission to take over and consolidate 35 electric light and power companies operating in different counties, and will carry out expansion and improvement program, including transmission line construction. Company also requests authority to secure a controlling interest in 11 other light and power utilities. It is under direction of Electric Bond & Share Co., 2 Rector Street, New York.

David E. and Alvin Street, 110 South Lehigh Street, Allentown, Pa., have organized Universal Safety Signal Mfg. Co., with capital of $100,000, to operate a local plant for manufacture of automobile signal and safety devices and systems. Alvin Street will be treasurer and representative.

The Crane Market

INQUIRIES for locomotive cranes continue, but the overhead crane field is still rather quiet. Most of the present activity in locomotive cranes is from contractors. The list of crawl-tread cranes and steam shovels for Dwight P. Robinson & Co., New York, has not yet been acted upon. Purchase of a 10-ton, overhead crane by the New York Central Railroad for its West Albany, N. Y., shops is expected soon.

Among recent purchases are:

Ford, Bacon & Davis, New York, 10-ton, 1-motor, overhead crane for Nazareth Cement Co., Nazareth, Pa., from Whiting Corporation.

Union Bag & Paper Co., New York, 16 chain blocks, 5 to 10-ton capacity, ranging up to 51-ft. lift, reported purchased from Harrington Co., Philadelphia.

Crucible Steel Co. of America, Pittsburgh, 25-ton overhead crane with 5-ton auxiliary for Park works, from a Western builder.

National Carbon Co., Inc., Keokuk, Iowa, 4-motor, 35-ft. span, 1½-yd. bucket gantry crane from Milwaukee Electric Crane & Mfg. Corporation.

Victor Chemical Works, Chicago Heights, Ill., 10-ton, electric crane from Whiting Corporation.

Bliss & Laughlin, Inc., Harvey, Ill., an electric traveling crane from Harnischfeger Corporation.

Shipbuilding division of American Brown Boveri Electric Corporation, New York, operating at former plant of New York Shipbuilding Co., Camden, N. J., has taken option on portion of former shipyards of William Cramp & Sons Ship & Engine Building Co., Philadelphia, and is said to be planning to use property for building ocean-going liners. Company will also expand operations at Camden yards, placing work in progress on several transoceanic liners, provided with airplanes and landings. Lawrence R. Wilder is head.

Metropolitan Edison Co., Reading, Pa., is arranging for increase in capital from 900,000 shares to 1,500,000 shares of stock, preferred and common, and will increase indebtedness from $50,000,000 to $100,000,000, a portion of proceeds to be used for expansion in plants and system, including acquisition of new properties in this district.

Interstate Supply Co., Commercial Trust Building, Philadelphia, has been appointed direct factory representative in Philadelphia and vicinity for Northern Engineering Works, Detroit, maker of cranes and hoists. W. H. Beyer of Interstate company, will have personal supervision of account.

Philadelphia Chain Block & Mfg. Co., Mascher and Norris Streets, Philadelphia, has been formed to manufacture chain blocks and trolleys. Plant is equipped to do all kinds of machine work and to furnish chain either hand, electric or die welded. Company will not be in market for additional material for three or four weeks. John A. Bailey, formerly superintendent Ford Chain Block Co., is president.

Detroit

DETROIT, June 4.

A NEW smelting furnace and auxiliary equipment will be installed by Calumet & Hecla Co., Calumet, Mich., in connection with expansion and improvement program under way. New unit will be 20 x 70 ft., designed for capacity of 225 tons of copper ore per day. Entire project will cost more than $1,000,000.

Board of Education, 1354 Broadway, Detroit, is reported planning installation of manual training equipment in two-story addition to Southeastern high school to cost $375,000, for which plans will be drawn by Malcomson & Higginbotham, 1257 Griswold Street, architects. McColl, Snyder & McLean, Penobscot Building, are mechanical engineers.

Detroit Edison Co., 2000 Second Avenue, Detroit, will install three 50,000-kw. turbo-generators, six boiler units and auxiliary equipment at its new Delray power plant No. 3, now in course of construction, scheduled to be ready for operation late in 1929. Work will be carried out in connection with recently approved $30,000,000 expansion and betterment program, which will include construction of four new automatic power substations, and extensions in present power substations at Grand River, Hart, Amsterdam and Cortland, with new transmission lines in these and other districts.

Detroit Motorbus Co., 14401 Dexter Boulevard, Detroit, has awarded general contract without competition to Bryant & Detwiler, Dime Bank Building, for one-story addition to service, repair and garage building, reported to cost in excess of $70,000 with equipment.

Valley Castings & Pattern Co., Bay City, Mich., has work under way on one-story addition, to be used largely as a brass foundry, which will more than double output in this department. Extensions will be made also in pattern shop.

Ex-Cell-O Tool & Mfg. Co., 1469 East Grand Boulevard, Detroit, has awarded general contract to Austin Co., General Motors Building, for new two-story unit, 130 x 190 ft., to cost close to $80,000 with equipment. It will be equipped primarily as machine shop and tool division.

Chrysler Motor Corporation, Highland Park, Detroit, has awarded general contract to Walbridge-Aldinger, Inc., Penobscot Building, for new assembling plant on East Jefferson Avenue, to cost close to $500,000 with machinery. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

Accuralite Co., Terrace Street, Muskegon, Mich., manufacturer of piston rings and other precision products, has awarded general contract to Austin Co. for one-story addition, 80 x 200 ft., to cost about $40,000 with equipment.

Woodin & Day, 1085 Detroit Street, Flint, Mich., will build a one-story battery service and repair works to cost about $21,000.

Rich Products Corporation, Battle Creek, Mich., has been organized to take over former Rich Steel Products Co., manufacturer of automotive valves and tappets, with plants at Battle Creek and Marshall, Mich. Marshall plant is at present under construction and will partly take place of unit formerly operated in California which has been sold.

Melling Machine Co., Jackson, Mich., has been formed as subsidiary of Jackson Motor Shaft Co. to drill crankshafts for latter organization. Plant has been completed and no new equipment or materials will be required at present.

National Brass Co., Grand Rapids, Mich., has been purchased by S. D. Stanley and Samuel Silverman, who operate Stanley Foundry Co. of that city. National plant will be known as Stanley plant No. 2.

Gulf States

BIRMINGHAM, June 4.

PROPERTY is being acquired at Houston, Tex., by Eternit, Inc., 225 South Fifteenth Street, Philadelphia, manufacturer of asbestos shingles, etc., as site for branch plant, to cost close to $1,000,000 with equipment. It will include power house and machine shop.

Common Council, Stamford, Tex., is planning extensions and improvements in municipal electric light and power plant, including installation of additional generating equipment. Henry Cook, superintendent of water, is in charge.

Houston Oil Co., Petroleum Building, Houston, Tex., is disposing of a bond issue of $8,000,000, a portion of proceeds to be used for extensions and improvements, including pipe line construction.

Alamo Heights School Board, San Antonio, Tex., is considering installation of manual training equipment in new junior high and grade school to cost $250,000, for which superstructure will soon begin. Harvey P. Smith, National Bank of Commerce, is architect.

Gulf Fertilizer Co., Thirty-sixth Street, Tampa, Fla., has awarded general contract to Austin Co., Cleveland, for new one-story mill, 160 x 306 ft., with two wing extensions, each 80 ft. long, to cost close to $200,000 with machinery.

Southern Produce Co., Flatonia, Fla., has plans for one-story cold storage and refrigerating plant, to cost close to $40,000 with equipment.

Mississippi Power & Light Co., Jackson, Miss., is said to be planning construction of steam-operated electric power house at Myrtle, Miss., to cost about $35,000. Extensions will be made in transmission lines.

E. K. Ahler and H. L. Shaw, State National Bank Building, Corpus Christi, Tex., architects and engineers, have plans for a new cotton compress plant, 280 x 1400 ft., in vicinity of Agua Dulce, Tex., for company whose name is temporarily withheld, to cost about $170,000 with equipment.

Chalona Brothers, Buras, La., operating a local packing plant, are planning construction of an electric light and power plant for service in this district, to cost close to $25,000.

City Commissioners, City Hall, Orlando, Fla., are asking bids until June 13 for one airplane hangar for municipal airport, as per specifications on file, city engineer office.

Henry Brothers & Co., Tampa, Fla., plan installation of cold storage and refrigerating equipment in connection with proposed meat-packing plant, to cost close to $55,000.

Dallas Vocational School, Dallas, Tex., C. A. Jay, director, is arranging fund of about $500,000 for institutional buildings on Cedar Springs Road. It is expected to begin work late in fall. Chamber of Commerce is interested in project.

Commission Council, City Hall, Baton Rouge, La., is asking bids until June 26 for equipment for municipal sewage system, including two 2500-gal. per min. pumping units, with auxiliary equipment. L. J. Voorhies, City Hall, is consulting engineer.

Common Council, Greenville, Miss., is considering installation of municipal electric light and power plant, to cost in excess of $50,000 with equipment. Burns, McDonnell & Smith, Interstate Building, Kansas City, Mo., are consulting engineers.

Palm Beach County Board of Public Instruction, Palm Beach, Fla., plans installation of manual training equipment in new junior high school at South Palm Beach, for which tract of 20 acres has been purchased. Plans will soon be prepared. It is reported to cost in excess of $250,000.

State Board of Control, Austin, Tex., is asking bids until June 21 for highway equipment as follows: 20 60-hp. crawler-type tractors; 30 12-ft. engine hitch graders; 21 5-ton three-wheel rollers; 38 asphalt heating kettles, mounted on rubber-tired tractors, approximate capacity 300 gal.; 28 rotary steel broom street sweepers; five portable air compressors complete with 1-ton trucks; two portable crushing and sizing plants, approximate capacity 75 tons per day. Specifications at office of State highway department, Austin; R. I. Tennant, purchasing division, in charge.

Dedman Foundry & Machine Co., foot of Buffalo Street, Houston, Tex., has been formed to operate general jobbing shop, manufacturing gray iron, brass and aluminum castings and patterns and doing machine work of all descriptions. Company has building and equipment and does not contemplate any purchases at present.

Webb Tank & Tile Co., Baton Rouge, La., has been organized to manufacture patented septic tank and concrete drain pipe. Manufacturing building has been erected.

St. Louis

ST. LOUIS, June 4.

PLANS are being drawn by United States Cold Storage Co., 500 East Third Street, Kansas City, Mo., for a new six-story cold storage and refrigerating plant, to cost about $1,000,000 with machinery. A. Epstein, 2001 West Pershing Road, Chicago, is engineer.

Following recent sale of its plant on Kingshighway, Valley Electric Co., St. Louis, manufacturer of electrical equipment and supplies, has leased a building at 4221 Forest Park Bouvelard for new plant. Early occupancy is planned. Former plant has been acquired by Superior Oxy-Acetylene Co., for new works.

Underwood Compress Co., Hollis, Okla., is completing plans for one-story cotton compressing plant, 220 x 600 ft., to cost close to $150,000 with equipment.

Jean P. Fleming, 4460 Gibson Avenue, St. Louis, and associates are planning new three-story automobile service, repair and garage building, to cost more than $160,000 with equipment.

Public Service Co., Bartlesville, Okla., plans construction of power transmission line from Bartlesville to Nowata, Okla., with new power substation at latter place, to cost close to $50,000.

Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo., is reported planning early rebuilding of portion of mill at Oklahoma City, Okla., recently destroyed by fire, with loss reported upward of $175,000 including equipment.

Common Council, Stanberry, Mo., is considering installation of municipal electric light and power plant, and will secure estimates of cost soon.

Oklahoma Gas & Electric Co., Oklahoma City, Okla., has purchased local Belle Isle generating plant of Oklahoma Railway Co., with rated capacity of 13,000 kw., and has leased transmission lines owned by same company. Expansion will be carried out for service at Norman, El Reno and vicinity, including power line construction.

Consolidated School District, Normandy, Mo., has awarded general contract to I. L. Davis Construction Co., 707 Park Avenue, Columbia, Mo., for two-story vocational school, to cost $125,000 with equipment. W. B. Ittner, Inc., 911 Locust Street, St. Louis, is architect.

Best Brothers-Keene Cement Co., Medicine Lodge, Kan., has plans for a one-story addition, 80 x 100 ft., to cost more than $75,000 with equipment.

Foster-Hall Tire Co., 1221 Frederick Street, St. Joseph, Mo., is having plans drawn for a one-story automobile service, repair and garage building, with tire storage and distributing building adjoining, to cost upward of $125,000 with equipment. Walter Boschen, Tootle-Lacy Bank Building, is architect.

Oliver Iron & Steel Corporation, Pittsburgh, manufacturer of galvanized pole line hardware and construction specialties, has opened new warehouse at Nineteenth and Campbell Street, Kansas City, Mo., where a complete stock of pole line material will be maintained. W. M. Watters, district manager of Oliver corporation, formerly at 209 Baltimore Building, will be in charge.

Indiana

INDIANAPOLIS, June 4.

PLANS are being prepared by Anderson Stove Works, Anderson, for a one-story addition, to cost close to $45,000 with equipment.

Southern Indiana Gas & Electric Co., Evansville, will make extensions and improvements in power plant, with installation of new equipment, to cost in excess of $200,000. Expansion will be carried out also in central steam-heating system in vicinity of Eighth Street.

Dubois-Robineau Furniture Co., Dubois, is considering early rebuilding of two-story plant recently destroyed by fire, with loss reported at $100,000 including equipment. J. M. Schanaum is treasurer.

Indiana Hydro-Electric Power Co., Lafayette, has arranged for bond issue of $3,000,000, a portion of proceeds to be used for expansion and improvements, including transmission line construction. Company has acquired properties of Tippecanoe Hydraulic Co., and Tippecanoe Electric & Power Co., including three power sites in vicinity of Monticello. E. Van Arsdel is president.

Major Brothers Packing Co., South Logan Street, Mishawaka, is considering installation of cold storage and power machinery in new three-story packing plant, to cost in excess of $300,000 with equipment. Packers' Architectural & Engineering Co., 431 South Dearborn Street, Chicago, is architect and engineer.

Martin-Parry Corporation, 1100 West Henry Street, Indianapolis, manufacturer of commercial automobile bodies, has arranged for sale of plant of Oakes Corporation on Roosevelt Avenue to Harris, Small & Co., for price in excess of $1,000,000. Plant has been used heretofore for production of metal stampings for automobile bodies, and this production will be carried on by Martin-Parry organization at its own plant.

Indianapolis Water Co., 113 Monument Circle, Indianapolis, is disposing of a preferred stock issue to total $704,700, portion of proceeds to be used for extensions and improvements in waterworks and system, including additional equipment.

Dean Forging Co., Muncie, is said to be arranging for immediate rebuilding of portion of plant recently destroyed by fire, with loss in excess of $50,000 including equipment.

Cleveland

CLEVELAND, June 4.

MACHINE-TOOL business and inquiry are slowing down, although some manufacturers and dealers report a fair volume of single tool orders. Larger types of machine tools are inactive. While orders are well scattered, there is more activity in the automotive than in other fields. Buying is rather light in the Detroit territory, as no large lists are coming from automobile manufacturers. Railroad inquiry is limited to small single machines. In the electrical field motors are moving quite well.

Midland Steel Products Co., Cleveland, will enlarge its Detroit plant by an addition of 48,000 sq. ft. of floor space and add considerably to its departments devoted to manufacture of automobile frames and other stampings. Some new equipment will be installed. An appropriation of $250,000 has been authorized by board of directors for these extensions. Entire building program for Detroit plant involves an estimated expenditure of $600,000, general plans having been approved for a large extension to department for manufacturing automobile brakes. Details of this part of extension program have not been approved.

Akron Lamp Co., 600 South High Street, Akron, Ohio, is planning new two-story plant, 60 x 75 ft., to cost in excess of $25,000 with equipment.

Henry & Murphy, Second National Bank Building, Akron, Ohio, architects, have revised plans for two-story automobile service, repair and garage building, to cost close to $100,000 with equipment.

City Ice & Fuel Co., 6611 Euclid Avenue, Cleveland, operating ice-manufacturing plants, is arranging for a preferred stock issue of $35,000,000 and increase in common stock from 1,000,000 to 3,000,000 shares, a portion of proceeds to be used for expansion, including acquisition of other ice-making and cold storage plants.

Ohio Public Service Co., Hanna Building, Cleveland, will soon take bids on general contract for a one-story equipment storage and distributing plant at Elyria, Ohio, to cost about $80,000 with equipment. R. S. Silsbee, Elyria Savings & Trust Building, is architect.

Seiberling Rubber Co., West Hopocan Avenue, Barberton, Ohio, manufacturer of automobile tires and tubes, is considering a three-story addition, to cost about $140,000 with equipment.

Plant and real estate of Warren Iron & Steel Co., Warren, Ohio, will be sold at auction during July by Industrial Plants Corporation, New York. Sale will include rolling mills, stamping plant, presses, shears, cranes, machine shop equipment, dies for circular saws, agricultural equipment, etc. Date of sale will be announced later.

Builders & Industrial Supply Co., 4090 Detroit Street, Toledo, Ohio, has been appointed distributer in Toledo and vicinity for products of Botfield Refractories Co., Philadelphia.

Detroit Steel Barrel Co., Toledo, Ohio, has been organized to succeed Detroit Range Boiler & Steel Barrel Co., and will continue manufacture of steel barrels and drums.

Cincinnati

CINCINNATI, June 4.

A MILD recession in machine-tool buying, largely of a seasonal character, is noted and indications are that June bookings will likely fall somewhat short of those in May. A number of builders, however, are fairly well satisfied with the volume of sales, which are made up mostly of orders from companies in many different industries. Automobile manufacturers have made scattered purchases, but in the aggregate, they constitute a rather small percentage of the total business. In the foreign field there has been one sizable transaction, negotiated by a local company, calling for machines amounting to from $50,000 to $60,000 to be shipped to a European country.

The United Engineering & Foundry Co., Pittsburgh, has bought a 30-in. x 24-ft. heavy-duty engine lathe, and an eastern Pennsylvania company has purchased a 24-in. slotter. Production in Cincinnati machine-tool plants is irregular, some shops having enough work ahead to sustain a good schedule of operations for fully 30 days, others being forced to curtail activities on account of the dearth of orders.

Bids will be received by State Department of Public Welfare, Columbus, Ohio, until June 14 for an ice-manufacturing plant at institution at Gallipolis, to cost about $45,000. H. B. Briggs, Hartman Hotel Building, is State architect.

Springfield Metallic Casket Co., Springfield, Ohio, is planning early call for bids on general contract for a five-story addition, to cost close to $100,000 with equipment.

Cleveland, Cincinnati, Chicago & St. Louis Railroad Co., Big Four System, Cincinnati, is having plans drawn for new locomotive and car repair shops at Bellefontaine, Ohio, to cost close to $160,000 with equipment.

Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until June 12 for 268 airspeed indicators and 373 single throat assemblies, circular 17; until June 14 for 120 aircraft altimeters, circular 19.

Lexington Utilities Co., Main Street and Broadway, Lexington, Ky., operating electric light and power properties, is arranging for increase in capital to $5,250,000, a portion of proceeds to be used for expansion, including transmission lines.

Officials of Hope Engineering & Supply Co., Mount Vernon, Ohio, have organized Kentucky Fuel Gas Corporation, Ashland, Ky., to take over and expand natural gas properties of American Rolling Mill Co., in Greenup, Carter and Boyd Counties. New company is disposing of bond issue of $5,000,000, a portion of fund to be used for purchase of properties and for expansion. Company will be under direction of Hope Engineering organization. C. W. Sears is president.

City Council, Kingsport, Tenn., is asking bids until June 26 for equipment for municipal waterworks, including raw water pumping station and filtration plant of 2,000,000-gal. per day capacity, and 1,000,000-gal. steel storage tank, with accessories. Wiedeman & Singleton, Atlanta, Ga., are engineers.

Ramsey Mfg. Co., 143 North Fifth Street, Columbus, Ohio, manufacturer of vacuum cleaners, blowers, etc., is planning installation of additional equipment, including slitting power shears, forming machines and other tools.

House-Hasson Hardware Co., 759 Western Avenue, Knoxville, Tenn., has awarded general contract to A. H. Whisman, 422 Front Street, for new three-story storage and distributing plant, 50 x 170 ft., on adjoining site, to cost close to $50,000 with equipment. R. F. Graf & Son, Journal Building, are architects.

Board of Education, Newark, Ohio, plans installation of manual training equipment in new three-story junior high school at East Newark to cost upward of $200,000, for which bids will be received on general contract June 15. Vernon Redding, Walpark Building, is architect. O. J. Barnes is general superintendent.

Midwest Locomotive Works, Cincinnati, maker of industrial locomotives, has been taken over by owners of Columbia Machine Tool Co. and Ceramic Machinery Co., Hamilton, Ohio. Plant has been moved to latter city where locomotives from 3 to 15-tons capacity will be manufactured. Larger sizes will be added. Repairs for Burton friction drive locomotives, formerly built by Burton Co., predecessor of Midwest company, will be furnished as heretofore. Locomotive business will be operated as division of Columbia and Ceramic companies and equipment and space is available in plants of these companies.

Shartle Machine Co., 359 Dublin Avenue, Columbus, Ohio, maker of machinery and power equipment, is in market for one 175 to 225-hp. gas engine of modern design, preferably three-cylinder, and one 300-hp. engine direct connected to 200-kw., 250-volt generator.

New England

BOSTON, June 4.

JUNE opened with no increased activity in the machine-tool market. However, tools sold the past week, although few in number, were of more importance than those of the previous week and included three new radial drills and a new surface grinder to a Hartford plant; a used 24-in. Bullard vertical boring mill to a Worcester plant; a used No. 52 Bliss press to a Worcester company; a practically new 24-in. lathe to a Connecticut firm; a fairly large used planer and a large used shear to Massachusetts plants, in addition to a half-dozen smaller tools. A good volume of repair parts has also been sold.

An encouraging feature is the sizable amount of prospective business which is still considered active. This includes a list for the Boston & Albany Railroad, some tools for the New Haven and the Boston & Maine railroads, as well as a fairly long list of one, two, three or more items of equipment required by industrial plants. When these tools will be purchased is uncertain, but in all probability not until after the political conventions are over.

Small tools continue active. May was the best month for some in the trade so far this year.

Crofut & Knapp Co., South Norwalk, Conn., has plans for expansion, work on which will start about July 1.

Taunton-New Bedford Copper Co., 24 North Front Street, New Bedford, Mass., contemplates an addition for a new treatment of metals. Details will be announced later.

Bids have closed on a coal pocket to be erected by Staples Coal Co. at Warren, R. I., for which conveying equipment is required. O. Perry Sarle, 95 Franklin Street, Providence, is architect.

William Higginson, 101 Park Avenue, New York, architect, has plans for a one and two-story printing plant at Greenwich, Conn., for the Condé Nast Publishing Co. Motors and miscellaneous equipment are required.

Plans will be ready about Aug. 1 for a trade school at Westfield, Mass., to cost, without equipment, $80,000. Ralph M. Sizer, 12 Elm Street, Westfield, is architect.

Fletcher Thompson, Inc., 542 Fairfield Ave., Bridgeport, Conn., architect, closed bids June 4 on a one-story 100 x 150-ft. machine shop addition for Baird Machine Co., Stratford, Conn.

Dayton Mfg. Co., Torrington, Conn., automobile accessories and supplies will erect a two-story plant to meet needs of increasing business.

Package Machinery Co., Springfield, Mass., has purchased Furguson & Haas, Inc., New York, wrapping machinery, and will move raw material, unfinished work and equipment to

Springfield plant. Official staff and directors of Springfield company will remain as heretofore. Mr. Furguson and Mr. Haas will be actively identified with new owners.

Hartford Electric Light Co., Hartford, Conn., will increase capacity of steam-operated electric power plant on Commerce Street, to cost about $200,000 including equipment.

L. G. Balfour & Co., 25 County Street, Attleboro, Mass., manufacturer of plated jewelry products, metal novelties, etc., has plans for a two-story addition, to cost upward of $50,000 with equipment. F. B. Perry, 44 Franklin Street, Providence, R. I., is architect.

Kidder Press Co., Dover, N. H., manufacturer of printing presses, paper mill machinery, etc., has concluded merger with National Woodworking Machinery Co., of same place, and United Printing Machinery Co., 470 Atlantic Avenue, Boston, under first-noted name. It is understood that present plants will be continued as heretofore and expansion in manufacture carried out. Offices will be maintained at Boston, New York, Chicago and Toronto. Joel F. Shepard, formerly head of National company, will be vice-president and general manager of consolidated company.

Nashoba Cold Storage Co., Ayer, Mass., care of Haynes & Mason, 280 Main Street, Fitchburg, Mass., has plans for a two-story cold storage and refrigerating plant, 75 x 160 ft., to cost about $65,000 with equipment.

Colonial Air Transport Co., care of Springfield Airport Corporation, Springfield, Mass., has leased portion of Fisk Park airport and plans early construction of hangars, repair shop, tool house, and oil storage and distributing building.

A. F. Curtin Valve Co., 76 Ship Avenue, Medford, Mass., has awarded general contract to J. A. Ricker, 36 Dudley Street, for a one-story addition, to cost about $23,000 with equipment.

W. E. Louttit, 93 Cranston Street, Providence, R. I., has filed plans for a one-story automobile service, repair and garage building to cost close to $100,000 with equipment.

James Purdon, 50 Congress Street, Boston, architect, has completed plans for a two-story automobile service, repair and garage building, 100 x 150 ft., at Winchester, Mass., to cost about $100,000 with equipment.

Metal Craftsmen, Inc., 141 Georgia Avenue, Providence, R. I., has been organized to manufacture patented window ventilator. It contemplates enlargement of plant soon and will then probably be in market for materials and equipment.

Buffalo

BUFFALO, June 4.

BOARD OF EDUCATION, Genesee Building, Buffalo, will soon complete plans for two-story Burgard vocational school at Kensington and Fillmore Avenues, to cost approximately $1,000,000 with equipment. Ernest Crimi, Genesee Building, is architect.

Work has been started on new airport at LeRoy, N. Y., by Donald Woodward, LeRoy, and associates, to include hangar, 100 x 140 ft., repair shop, tool department, and oil storage and distributing building to cost more than $70,000 with equipment.

Roger D. DeWolf, 330 Barrington Street, Rochester, N. Y., and associates have organized DeWolf Furnace Corporation with capital of $25,000, to operate a local plant for manufacture of furnaces, parts, etc. Wirt D. Seeley, 24 Mayfield Street, is interested in company.

Laclede Mfg. Co., 1443 Niagara Street, Buffalo, manufacturer of paper goods, has asked bids on general contract for new one-story plant, to cost close to $100,000 with equipment. E. G. Speyer, Ellicott Square, is architect and engineer.

Lincoln Radiator Co., Utica, N. Y., has leased vacant plant of National Radiator Co., North Tonawanda, N. Y., and will occupy for new plant for production of cast iron radiators for domestic and other heating service.

George C. Rounds, White Building, Buffalo, is having plans drawn for a six-story automobile service, repair and garage building, to cost $230,000 with equipment.

City Council, Buffalo, is considering extensions in municipal airport, including new hangar units and repair shops. Lieut. Edwin M. Ronne is director.

Plant and real estate of Standard Turbine Corporation, Scio, N. Y., will be sold at auction during August by Industrial Plants Corporation, New York. Sale will include new machine shop and power house, boring mills, heavy-duty lathes, radial drills, open-side planers, shapers, grinders, turret lathes, drills, compressors, etc. Date of sale will be announced later.

Henry L. Kohlmetz Iron Works, formerly on North Water Street, Rochester, N. Y., manufacturer of stairs, grills, gates and other ornamental iron products, has removed its plant to larger quarters at Mill and Furnace Streets.

Border Metal Products, Inc., 1449 Niagara Street, Buffalo, has been organized to manufacture metal and allied products, particularly nickel stove pipe, furnace pipe and hot air registers. Company has plant at above address and will soon be in market for materials and equipment.

United States Hoffman Machinery Corporation, Syracuse, N. Y., has taken title to tract of 12 acres, northeast of the city, for erection of a new plant with 140,000 sq. ft. of floor space, to cost $500,000. Lockwood, Greene & Co., New York, are engineers.

South Atlantic States

BALTIMORE, June 4.

CONTRACT has been let by Bowker Chemical Co., First Street and Tenth Avenue, Baltimore, to Consolidated Engineering Co., 20 East Franklin Street, for rebuilding portion of plant recently destroyed by fire, including three two and three-story buildings, to cost more than $80,000. Engineering department of American Agricultural Chemical Co., 419 Fourth Avenue, New York, parent organization, is in charge.

DeLion Tire & Rubber Corporation, Eager and Fifth Streets, Baltimore, is reported considering one or two-story addition to cost approximately $35,000 with equipment. S. C. Cooke is company official in charge.

Plant and equipment of Hampstead Mill & Body Works, Inc., Hampstead (Carroll County), Md., will be sold at public auction, June 13, by L. C. Caltrider and C. R. Wattenscheidt, receivers.

Arrington Cold Storage Corporation, Arrington, Va., has awarded general contract to John P. Pettijohn, Lynchburg, Va., for four-story cold storage and refrigerating plant, 103 x 124 ft., to cost upward of $100,000 with machinery. Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect and engineer.

Prudential Refining Corporation, Baltimore, formerly Prudential Oil Corporation, with refinery in Curtis Bay section, is disposing of bond issue of $2,000,000, considerable portion of fund to be used for extensions and improvements, including modernization of present refinery, to develop daily capacity for handling 10,000 bbl. of crude oil.

Carroll Independent Coal Co., Baltimore, has acquired site on Twenty-fifth Street, now used in part for company plant, and contemplates extensions in storage and distributing facilities, including one-story automobile service, repair and garage building, to cost $100,000.

City Council, Macon, Ga., has acquired tract of 250 acres for municipal airport, to be known as Miller field, and plans construction of hangars, repair shops and other buildings.

General purchasing officer, Panama Canal, Washington, is asking bids until June 19 for wire rope, chains, staybolt iron, shovels, chisels, hammers and other tools, Panama schedule 1881.

Georgia Manganese & Iron Co., care of Joel Hurt, Hurt Building, Atlanta, Ga., is planning development of manganese properties near Cartersville, Ga., including installation of mining and refining equipment for production of about 200,000 tons per annum. A large capacity mechanical washing plant will be provided, entire project to cost close to $1,500,000.

Public Improvement Commission, City Hall, Baltimore, is arranging fund of close to $6,500,000 for extensions and betterments in municipal waterworks, including new pumping plant for Mount Royal-Vernon section, to cost about $625,000 with machinery, and pumping station for Curtis Bay district, to cost approximately $70,000. Water department will be in charge.

Quartermaster, Fort Monroe, Va., is asking bids until June 16, for construction of two standard hangars at Langley Field, Va., units to be of steel type, with repair facilities.

In connection with proposed rayon mill on James River, near Richmond, Va., American Enka Corporation, 114 East Thirty-second Street, New York, contemplates construction of power house, machine shop and other mechanical units. Entire project is reported to cost more than $1,200,000.

Bureau of Fisheries, Washington, is asking bids until June 28 for one full Diesel heavy-duty, direct-connected, reversible type marine engine of 150 hp., for installation in vessel at Boothbay Harbor, Me.

Airport Committee, Chamber of Commerce, Marion, N. C., W. S. Shiflet, chairman, is considering early establishment of municipal airport, with hangars, repair shops and other mechanical units.

Chapman-Storm Lumber Corporation, Holly Hill, S. C., A. F. Storm, president, is planning purchase of steel water tank, about 25,000-gal. capacity.

Spartanburg Textile Machinery Co., Spartanburg, S. C., is said to have concluded arrangements for purchase of

local plant of American Machine Shops and will equip for new branch plant.

Common Council, Vass, N. C., is asking bids until June 12 for municipal waterworks system, including 100,000-gal. capacity tank on steel tower, deep-well pumping station, etc. Carolina Engineering Co., Johnston Building, Charlotte, N. C., is engineer.

Superintendent of prisons, Department of Justice, Washington, will receive bids until June 11 for one gasoline power shovel and extra boom, with approximately 40-ft. two-way block and fall to convert shovel into crane.

Samuel H. Kennedy, Tunnel Hill, Ga., is organizing Samuel H. Kennedy Co., with $150,000 capital stock, to manufacture automotive and agricultural appliances, also builders' equipment designed by organizer.

Pittsburgh

PITTSBURGH, June 4.

MACHINE-TOOL sales in this district for May were fairly good. Betterment, which set in about the middle of the month, continued and sales during the last half were sufficient to bring the total above that of April and well up toward the average for the first three months of the year. Single tool orders have been the rule. The third quarter tool list of the Westinghouse Electric & Mfg. Co. is expected to be out about the end of this month, and as purchases against the first and second quarter lists were limited, a heavy third quarter inquiry is looked for.

Contract has been let by Miller Saw Trimmer Co., Penn Avenue and Water Street, Pittsburgh, manufacturer of printers' machinery and parts, to Hughes-Foulkrod Co., 421 Seventh Avenue, for a one and two-story addition, to cost close to $200,000 with equipment. Hunting, Davis & Dunnells, Century Building, are architects.

South Penn Oil Co., 541-49 William Penn Way, Pittsburgh, has completed plans for new oil storage and distributing plant at Wheeling, W. Va., to cost about $125,000 with equipment. J. F. Kuntz, Westinghouse Building, Pittsburgh, is architect.

Pittsburgh Parking Garage, Inc., 555 Sixth Avenue, Pittsburgh, J. Wilworth, president, will soon take bids on general contract for seven-story service, repair and garage building, to cost $175,000 with equipment.

City Controller, City-County Building, Pittsburgh, will receive bids until June 21 for furnishing and installing power house equipment at Pittsburgh city home and hospital, Mayview, Pa. (contract No. 7); water-softening equipment at same place (contract No. 8); steam lines and appurtenances (contract No. 2); power lines and auxiliary equipment (contract No. 3); and sewer, water and gas lines (contract No. 5). Plans and specifications at office of Morris Knowles, Inc., Westinghouse Building, engineer.

W. J. Burkart, 518 North Pennsylvania Avenue, Greensburg, Pa., and associates have organized Continental Boiler & Radiator Co., to operate plant in vicinity of West Newton, Westmoreland County, for manufacture of boilers, radiators, gas-fitting specialties and kindred equipment. J. A. Henry, Jeanette, Pa., will be an official of new company.

Board of Education, Washington, Pa., plans installation of manual training equipment in new high school to cost $850,000, for which C. L. Wooldridge, Fulton Building, Pittsburgh, engineer, will prepare plans.

American Instrument Works, 18 East Lacock Street, Pittsburgh, maker of jigs, fixtures, tools, etc., has changed its name to American Die & Instrument Works. E. A. Schurk is secretary and treasurer.

Milwaukee

MILWAUKEE, June 3.

MODERATE activity in new business is reported by manufacturers of machine-tools. In several instances, shops entered the month with more specifications than at the beginning of May, but as a rule, the May volume fell below April. Demand continues spotty, but a fair aggregate is being furnished by a widely diversified list of buyers. There has been an improvement in the foundry business, due mainly to a better call for automotive castings.

Business of Lang & Scharmann, foundry and machine shop, Marshfield, Wis., has been incorporated as Lang & Scharmann, Inc., with a capital stock of $50,000. George J. Lang and Otto T. Scharmann continue as principal owners and active managers. Some improvements in plant and equipment are being made.

Milwaukee assembling plant of Ford Motor Co., which closed down June 8, 1927, is expected to resume operation June 11. About 600 men are expected to be employed by July 1. Harry M. Buckley is branch manager.

Green Bay & Western Railway, Green Bay, Wis., is starting work on a warehouse and service shop at its terminal, 60 x 200 ft. With equipment cost is estimated at $50,000.

Hurd Lumber Co., Medford, Wis., is purchasing miscellaneous equipment for a cutting plant addition, 90 x 100 ft., costing about $40,000. H. M. Hurd is president and general manager.

Plans for a one-story addition, 74 x 80 ft., to gray iron shop of Armstrong Foundry Co., 1530 Junction Avenue, Racine, Wis., are being revised by J. Mandor Matson, local architect, and new bids will be taken about June 15.

Nash Motors Co., Kenosha, Wis., is pushing work on two one-story additions, 30 x 128 and 80 x 160 ft., to its branch factory at Racine, Wis., and is placing final orders for new equipment.

Beloit Box Board Co., Second Street, Beloit, Wis., is breaking ground for a two-story addition, 103 x 110 ft., to cost $60,000 with machinery.

Appleton Coated Paper Co., Appleton, Wis., has plans for a new finishing room addition, 104 x 240 ft., two stories, requiring super-calendering and sheet cutting equipment with electric motor drive. It is to be ready about Oct. 15. Charles S. Boyd is general manager.

Devereaux-Olson Construction Co., 716 Eleventh Avenue, South, Minneapolis, Minn., is low bidder at $29,000 for erection of a new central heat and power plant, 57 x 115 ft., at State Teachers College, Oshkosh, Wis. It will require three 150-hp. boilers with automatic stokers, 600 tons coal storage capacity, ash-handling equipment, and contain a general machine and repair shop. The total cost will be $80,000.

City of Waukesha, Wis., closes bids June 11 for construction of a municipal sewage disposal plant costing $190,000, designed by Alvord, Burdick & Howson, consulting engineers, Chicago. Bids are being asked on (a) sewage disposal plant construction, (b) tank equipment and accessories, (c) pumping equipment, and (d) cast iron pipe and fittings. A. R. Schuh is city engineer.

Drott Tractor Co., 123 Wisconsin Avenue, Milwaukee, distributer of Caterpillar tractors and equipment, has let general contract to Paul Riesen's Sons Co., 1018 Humboldt Avenue, local, for construction of a $90,000 headquarters building for sales, service and repairs. It will contain a complete machine and forge shop. Architects are M. Tullgren & Sons Co., 20 Prospect Avenue, Milwaukee.

Pacific Coast

SAN FRANCISCO, May 31.

PLANS are under way by California Wire & Cable Co., Orange, Cal., for one-story addition, 42 x 85 ft., to cost approximately $18,000 with equipment.

Apple Growers' Cold Storage Co., Watsonville, Cal., is asking bids on general contract for one-story cold storage and refrigerating plant, 300 x 500 ft., to cost $250,000 with equipment. Uttley & Kleindinst, 354 Hobart Street, Oakland, Cal., are engineers.

National Paper Products Co., 562 Battery Street, San Francisco, an interest of Zellerbach Co., same address, is considering construction of second unit at kraft paper mill at Port Townsend, Wash., where first unit is now being completed. New structure will double capacity, and is reported to cost more than $2,000,000 with equipment.

City Council, Idaho Falls, Idaho, is arranging bond issue of $100,000 for municipal hydroelectric power plant on Snake River.

Moreland Motor Truck Co., Twenty-fourth and Main Streets, Los Angeles, with plant at Burbank, Cal., is reported planning construction of branch assembling and distributing plant at Seattle, where site will soon be selected, to cost more than $80,000 with equipment.

Union Pacific Railroad Co., Omaha, Neb., has approved plans for an addition to engine house and shops at Ogden, Utah, to cost about $40,000 with equipment.

California Petroleum Corporation, 929 South Broadway, Los Angeles, has plans for a one-story storage and distributing plant at San Pedro, with pumping station, etc., to cost about $45,000.

Moran Co., Garland Building, Los Angeles, architect, is preparing plans for one-story mechanical shop and woodworking plant, 100 x 200 ft., for company whose name is temporarily withheld, to cost close to $35,000 with equipment.

Sellers & Stone, Yakima, Wash., have filed plans for

one-story cold storage and refrigerating plant, to cost approximately $100,000 with machinery.

American States Public Service Co., Los Angeles, operating Los Angeles Gas & Suburban Water Co., South Coast Gas Co., and other utilities, is disposing of bond issue of $1,250,000, portion of proceeds to be used for expansion and improvements in plants and system.

Oregon Portland Cement Co., Portland, has filed plans for three-story and basement storage and distributing plant, 100 x 100 ft., to cost in excess of $60,000 with elevating, conveying and other equipment. L. L. Dougan, Kraemer Building, is architect.

Richfield Oil Co. of California, Inc., Los Angeles, has been organized to take over and consolidate company of same name, with local refineries, and United Oil Co., with similar plants. Amalgamated company will carry out expansion program and has arranged for note issue of $5,000,000, a portion of proceeds to be used for that purpose.

Southwestern Machine Co., 316 Azusa Street, Los Angeles, has been formed to succeed Western Machine & Mfg. Co. and will manufacture special machinery, double-end punches and shears, inclinable presses in plain, back-geared and combination and worm speed reduction units up to 7½ hp. Special machinery will be built under contract and materials and equipment for other lines have been contracted for.

Canada

TORONTO, June. 4.

WHILE the general demand for machine-tools is confined to single orders, several small lists of a half-dozen tools have recently appeared. The past week the Advisory Vocational Committee placed orders for tools for the Toronto technical school. Some good sized orders are in prospect for new works now under construction which are expected to appear within the next two or three weeks. While most of the automotive buying is for replacement needs, additions are under way for two or three plants for which equipment will soon be required. Garages and repair plants are steady buyers of single tools. The Canadian General Electric Co. will spend approximately $500,000 on machinery and tools for additions to its Peterboro, Ont., plant.

International Nickel Co. has started work on addition to its plant at Port Colborne, Ont., to cost $75,000, and expects to start work soon on a second unit of same size and cost.

Studebaker Corporation plans to re-equip its plant at Walkerville, Ont., for manufacture of Studebaker and Erskine cars from parts made in Canada. About 400 additional men will be employed.

Canadan I. T. S. Rubber Co., Toronto, has taken out a permit for erection of a $90,000 factory building at corner of Royce and Edwin Avenues.

Drury Co., Montreal, Que., has awarded contract for erection of a $2,500,000 cold storage plant at Halifax, consisting of a group of four buildings. Two units will be six stories.

Canadian General Electric Co., head office, Toronto, will build two extensions to its plant at Peterboro, Ont., 100 x 328 ft. and 90 x 100 ft. Buildings will cost approximately $300,000 and equipment about $500,000.

Smith Brothers, 188 Duke Street, Toronto, manufacturers of automobile and truck bodies, etc., have purchased a two-acre site for erection of a plant to cost $150,000.

Hill, Clarke & Francis, New Liskeard, Ont., have contract for the erection of a factory at New Liskeard for the Standard Diamond Drill Co., to cost $20,000.

Canadian Engine & Tool Co., Ltd., 10 Church Street, Windsor, Ont., has let contract to W. Pierce, 192 Partington Avenue, Sandwich, Ont., for erection of a one-story factory, 45 x 156 ft.

Nova Scotia Power Commission, Halifax, N. S., has awarded contract to Foundation Co. of Canada, Ltd., 746 Sherbrooke Street West., Montreal, for construction of a 30,000-hp., hydroelectric power development plant on Mersey River to cost $3,000,000.

Griswold & Co., Ltd., 1111 Beaver Hall Hill, Montreal, has been awarded contract for machinery, etc., for hydroelectric plant and dam to be built for Cie Electrique de Charlevoix, at Les Eboulements, Que. Tenders for power house and dam construction will be called later. Langlais, Ricard & Royer. 126 St. Peter Street, Quebec, are engineers.

London Shipping Containers, Ltd., 745 Yorke Street, London, Ont., manufacturer of corrugated paper boxes, wrappers, etc., is having plans prepared by John M. Moore & Sons, London, for erection of a plant at Windsor, Ont., to cost $50,000.

Atlas Construction Co., 37 Belmont Street, Montreal, has been awarded general contract for erection of a 2,000,000-bu. elevator with marine tower and grain conveyors, for Quebec Harbor Commission. It will cost approximately $1,000,000.

Anglin-Norcross, Ltd., Montreal, has contract for erection of locomotive and machine shops at Point St. Charles, Montreal, for Canadian National Railways. T. T. Irving, room 436, New Union Station, Toronto, is regional engineer.

Bates Valve Bag Co., Ltd., Cap de la Madeleine, Que., manufacturer of automatic bag filling and weighing machinery, etc., is having plans prepared for a 1½ story addition, 40 x 200 ft.

Otto Higel Co., Ltd., 680 King Street West, Toronto, is having plans prepared by G. M. Miller & Co., 71 Mutual Street, for a factory at St. Hyacinthe, Que., to manufacture piano actions, musical instruments.

E. G. M. Cape Co., 10 Cathcart Street, Montreal, has contract for an addition to plant of Simmons, Ltd., manufacturer of metal beds, 400 St. Ambrose Street, Montreal, to cost $240,000. Ross & MacDonald, 1 Belmont Street, are architects.

Bids are being received by B. H. & F. Prack, architect, 42 James Street North, Hamilton, Ont., for an addition to plant of Canadian Westinghouse Co., Ltd., Sanford Avenue North, Hamilton.

H. J. Heintz Co. is building a factory at Leamington, Ont., and will also erect a power plant.

Western Canada

Bids will be called soon by Hutton & Souter, architects, 6 James Street South, Hamilton, Ont., for erection of a distributing and assembly plant at Saskatoon, Sask., for General Motors of Canada, Ltd., head office, Oshawa, Ont. It will be one story, 80 x 300 ft., and cost $1,000,000.

Dominion Electric Co., Watrous, Sask., will build an addition to its power plant at Estevan, Sask.

Mid-West Utilities, Calgary, Alta., contemplates erection of a power plant at Nokomis, Sask., and power line from Nokomis to Watrous, Imperial and Simpson.

Dominion Electric Co., Watrous, Sask., is completing arrangements for construction of a power plant at Craik, Sask.

Plans are being prepared by J. A. Foester, City Hall, Prince Albert, Sask., for an addition to city power plant to cost $100,000.

General Steel Wares, Ltd., 305 Water Street, Vancouver, B. C., has started work on a one-story factory and warehouse, 125 x 250 ft.

Vulcan Iron Works, Ltd., Point Douglas, Man., will build an addition to its plant, one-story and three-story wing, 72 x 196 ft., steel and corrugated iron construction.

Bids are being received by J. C. Holden, District Engineer, Canadian Pacific Railway Co., Winnipeg, Man., for an addition to Weston freight car shops, Winnipeg, 305 x 317 ft.

Foreign

COMPANY manufacturing cutlery at Sheffield, England, has acquired site at Germiston, near Johannesburg, South Africa, and plans construction of branch plant. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference South Africa No. 66562; also at American Consulate,, Johannesburg, William L. Kilcoin, assistant trade commissioner.

Branch Office Representatives of The Iron Age

Editorial

Chicago, Otis Bldg.....R. A. Fiske
Pittsburgh, Park Bldg.....G. F. Tegan
Cleveland, 1362 Hanna Bldg.....F. L. Prentiss
Cincinnati, 408 Union Central Bldg.....Burnham Finney
Boston, Park Square Bldg.....Gerard Frazar
Washington, 536 Investment Bldg.....L. W. Moffett

Advertising

Chicago, Otis Bldg.....F. S. Wayne
Pittsburgh, Park Bldg.....W. B. Robinson
Cleveland, 1362 Hanna Bldg.....Emerson Findley
Cincinnati, 408 Union Central Bldg.....Peirce Lewis
Boston, Park Square Bldg.....H. E. Barr
Philadelphia, 1402 Widener Bldg.....Charles Lundberg
Buffalo, 835 Ellicott Sq.....B. L. Herman
Detroit, 7338 Woodward Ave.....Peirce Lewis
Hartford, Conn., P. O. Box 81.....D. C. Warren
New Jersey, Hotel East Orange, East Orange, N. J., W. C. Sweetser
New York, 239 West Thirty-ninth St., W. C. Sweetser, Chester H. Ober
San Francisco, 320 Market St.....W. A. Douglass

Electric Bond & Share Co., 2 Rector Street, New York, is reported considering plans for hydroelectric generating plant at Agos Falls, Agos River, Lanao, Philippine Islands, with initial capacity of about 25,000 kw., to cost more than $1,000,000 with transmission lines. Lyman B. Hammond is vice-president in charge.

Huff-Deland Dusters, Inc., subsidiary of Keystone Aircraft Corporation, 475 Fifth Avenue, New York, with plant at Bristol, Pa., has secured concession from Government of Peru for establishment and operation of passenger and mail air service between that country and United States. Planes will be constructed and landing fields arranged, including hangars, repair shops, oil storage and distributing plants, and other structures.

A company has been formed at Teschen, Silesia, Poland, to construct and operate a hydroelectric power plant on Sola River, for which concession has been granted by Ministry of Communications. Considerable portion of output will be used for operation of electric railroad line to be built from Oswiecim and Zywiec, Poland. Entire project is reported to cost more than $1,500,000. Information at American Consulate, Warsaw, Poland, Gilbert Redfern, assistant trade commissioner.

Imperial Chemical Industry, Ltd., London, England, is arranging for a stock issue to total about £4,300,000 (approximately $20,650,000), a considerable portion of fund to be used for expansion in manufacturing facilities.

Officials of Thomson-Houston Co., Paris, France, manufacturer of electrical machinery, associated with International General Electric Co., New York, and Societe Alsacienne de Constructions Mecaniques, manufacturer of similar equipment, with plant in Alsace-Lorraine, are organizing a new company to centralize production and distribution of both interests for electric and electro-mechanical equipment, and will develop expansion in both lines of manufacture. New company will be capitalized at 400,000,000 fr., of which about 150,000,000 fr. will represent working capital for production.

Koholyt Corporation, Berlin, Germany, manufacturer of sulphite pulp for paper manufacture, controlled by Inveresk Paper Co., Ltd., London, England, is arranging for sale of bonds in United States to total $4,000,000, a portion of proceeds to be used for expansion.

New Trade Publications

Oxyacetylene Welding in the Foundry.—Air Reduction Sales Co., 342 Madison Avenue, New York. Pamphlet of 12 pages, containing the text of a paper read by G. F. Wieser, engineering research department, before a recent welding conference at the University of Wisconsin. It emphasizes the ability to meet severe production schedules by reclamation of defective castings.

Woven Screens.—Ludlow-Saylor Wire Co., St. Louis. Booklet of 20 pages, illustrating and describing a line of woven screens with square holes, made of steel or other resistant materials. Larger openings are claimed for them than with round perforations in plates. Steel screens are listed with openings ranging from 4 in. square down to 1¼ in. and made of wire from 1 in. to No. 7 gage.

Sand-Conditioning Equipment.—C. O. Bartlett & Snow Co., Cleveland. Bulletin 61 of 20 pages illustrates and describes a variety of equipment for handling sand. Most of the illustrations are from installations, starting with the shake-out and going through the list to delivery of sand into flasks.

Concrete Floors.—Master Builders Co., 7016 Euclid Avenue, Cleveland. Booklet of 32 pages covering a survey of concrete floor conditions in industrial plants. A strong plea is made against accepting lowest bids on jobs, if a thoroughly satisfactory floor is to be obtained. Tested materials and skillful workmanship are needed for best wearing results.

Arc Welder.—General Electric Co., Schenectady, N. Y. Bulletin G. E. A.-874, of four pages, illustrates and describes an arc welder rated at 200 amp. furnished in both stationary and portable forms. It is driven by belt, motor or gas engine and has a current range from 50 to 300 amp. It is adaptable to metallic electrodes from 1/16 to ¼ in.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Dimensions and load data and price list in a pocket-size pamphlet of 40 pages. The sheets are punched for use in ring binder.

Material-Handling Equipment.—Elwell-Parker Electric Co., Cleveland. Catalog 150 of 40 pages illustrates and describes a wide variety of industrial electric tractors and trucks, including the units carrying cranes. The elevator tructor is featured.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

LIKE the little Spartan boy who registered no sign of pain while the fox gnawed his vitals, the great bulk of our readers observed the resumption of "The Last Word" with disappointing stoicism.

But not all were mute. A few (two) tossed laurels. Others may have sighed and murmured something about being grateful that it did not take up a whole page.

Now, we like criticism, but it must be constructive. We should probably say we lean toward having it favorable. By far the pleasantest comment came in metrical form, written by Miss V. E. Atwell, of Arlington, Cranston, R. I., whose nom de typewriter is "Eva."

Greetings—Desert Song

WAS I the first from whom you heard
When discontinuing "The Last Word"?
As at that time I wrote to you,
My weekly task is to review
Items of interest, more or less,
Appearing in the trading press.
And as I waded, pen in hand,
Through much I could not understand,
Details which nothing could make plain
To my poor feeble woman's brain,
My energy was always spurred
By "Soon I'll come to 'The Last Word' "!
"The desert ship" of other lands
Must tramp Sahara's shimmering sands;
But does the thought occur to him
Of the oasis' shadows dim?
Of evening's rest, and safe retreat
Beneath the palm trees, cool and sweet?
Of voices singirg, soft and low
Where streams of living water flow?
If thus he dreams, I'm telling you
I likewise had my visions, too;
"Soon all this technique I will spurn,
And to 'The Last Word' gladly turn"!
But when you took that hope away,
My light went out, my sky was gray;
Things technical I had to read,
The palm trees all had gone to seed,
The shadows fled, the well ran dry,
(So were the *pages;* so was *I*)!
But now I look those pages o'er,
Lured by a bright hope, as before.
The camel now may drink his fill,
The palm trees wave, the night is still,
And up above the desert's rim
The rising moon appears to him.
Accept my thanks, good gentlemen,
"The Last Word" has appeared again!

EVA.

Thank you, Eva.

Extra! Extra! Foreign Visitor Mistakes the Iron Age for a Bar Room

Clipping from the New York *World:*

Believe It or Not!

"An English friend of mine who is visiting this country chanced to glance through a New York telephone directory while at my home recently," said A. L. Glasser. "He seemed unusually interested, and I inquired the reason.

"'Why,' he answered, 'I thought Prohibition was at least theoretically in force in New York, but here I find listed a number of barrooms.'

"'Impossible!' I exclaimed. 'You must be mistaken.'

"'Not at all,' he replied. 'Look here,' and he turned the pages rapidly, indicating the names IRON AGE, *Judge*, the *New Yorker* and many others, next to each of which was the description 'a pub.'"

Mr. A. Steel is roll designer for the Judson Mfg. Co., San Francisco, Cal., steel producers.

And if the 231 million words, which have been printed in the copies of THE IRON AGE mailed to the Farrel-Birmingham Co. from 1872 to date, were placed end to end in a single line, including the marks of punctuation, nobody would read them. A. H. D.